11-15-68

ERIC REPORT RESUME

ERIC ACC. NO.			
ED 026 548			
CH ACC. NO.	**P.A.**	**PUBL. DATE**	**ISSUE**
AA 000 339	52	Feb69	RIEJUL69

IS DOCUMENT COPYRIGHTED? YES ☐ NO ☐
ERIC REPRODUCTION RELEASE? YES ☐ NO ☐
LEVEL OF AVAILABILITY I ☐ II ☐ III ☐

AUTHOR
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TITLE
The Extended and Experimenting College Library. Appendixes 1 - 3.

SOURCE CODE	INSTITUTION (SOURCE)
MGG30410	Hampshire Coll., Amherst, Mass.
SP. AG. CODE	**SPONSORING AGENCY**
RMQ66000	Office of Education (DHEW), Washington, D. C.

EDRS PRICE	CONTRACT NO.	GRANT NO.
0.75;8.20		OEG-1-7-071180-4351

REPORT NO.	BUREAU NO.
	BR-7-1180

AVAILABILITY

JOURNAL CITATION

DESCRIPTIVE NOTE
159p.

DESCRIPTORS
*College Libraries; *Information Systems; Automation; *Information Centers; *Dial Access Information Systems

IDENTIFIERS
Information Transfer Experimental Center; INTRAN

ABSTRACT

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BR-71180
PA-52

OE-BR

AA000339

INTERIM REPORT

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Robert S. Taylor
Hampshire College
Amherst, Mass. 01002

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U. S. DEPARTMENT OF
HEALTH, EDUCATION AND WELFARE

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ED026548

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THE EXTENDED AND EXPERIMENTING COLLEGE LIBRARY

Configurations and Functions of the Academic Library in Transition

Robert S. Taylor
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February 1969

The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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Table of Contents

Summary

I. Background and Philosophy of Hampshire College 1
II. Review of Activities 4
III. Configurations and Functions of the Academic Library in Transition 6
  A. Interlibrary Cooperation: The Hampshire College Library in the Five-College Community 8
  B. Automation and Processing of Library Materials . . . 11
  C. Relationship of Book and Non-Book Materials . . . 12
  D. The Effect of Technological Innovation on Library Design, Organization and Function . . . 14
  E. The Experimenting Library . . . 15

Appendix A. Hampshire College Library Conference: Relationship of Information Transfer systems and Experimentation to the Design and Function of the Library.

Appendix B. Hampshire College Library Conference: Planning for automated Systems in the College Library

Appendix C. Individual Consultants and Advisors

SUMMARY

There were four objectives in this first phase in developing the concept of the experimenting and extended college library: 1. exploration of the configurations, functions, and operations of the academic library in transition; 2. initial analysis of the elements of such a library in the context of an experimenting institution, i.e. Hampshire College; 3. design of a building for these elements; 4. analysis and prediction of interlibrary cooperation within a multi-college community. Building design was completed to include, as integral parts of the library, a book library, bookstore, display gallery, computing center, and an information transfer (INTRAN) experimental center. The building is now under construction.

The challenge for libraries is the creation of a new institution merging the best of the traditional library with a readiness and capability to make maximum use of innovation in communications technology. To do this several things are necessary. First, the library must contain not only books, but all forms of media relevant to the educational process, not as additional packages but as integral parts of the learning process. Second, the library must extend itself to responsibilities not normally included in the conventional library. Third, the library must be open-ended.

Within this context the project was directed toward a definition and preliminary analysis of factors involved in the transition process. Studies have been initiated in library cooperation among the five institutions of this area. A preliminary model was designed to predict the impact of a new college on other local libraries. A new library should have a machine readable base from the beginning. The project staff is reviewing the implications of MARC records and commercial processing on the automation of the college library. The relationship of book and non-book materials will be a critical problem for libraries in the future, as they move from object-oriented to communications-oriented institutions. Relevant to this is the concern of the project to isolate and analyze qualitative methods and criteria for predicting technological change and to assess its effect on library building, functions, and organization. Finally, the project is concerned with definition of experimental situations that can be undertaken when the college is in operation in 1970. Two approaches have been of particular concern: the combination of library catalog and record of bookstore inventory so that the user can have the option of borrowing or buying; the development of a context in which the library could be largely student operated.

I Background and Philosophy of Hampshire College

Hampshire College is a new, independent, experimenting liberal arts college which will open for students in 1970. It is intended specifically as a national pilot enterprise for innovations of quality in American higher education. Hampshire was brought into being through the iniative of faculty and administrative leaders of four institutions in the Connecticut Valley of Western Massachusetts: Amherst, Mount Holyoke, and Smith Colleges, and the University of Massachusetts. Hampshire is the result of planning begun in 1958, and its establishment was approved by the trustees and faculties of its four neighboring institutions. In 1965, the new college received a pledge of $6 million from Harold F. Johnson, an Amherst alumnus, and was incorporated under a charter granted by the Commonwealth of Massachusetts.

Franklin Patterson was appointed in April 1966 as the first President of Hampshire College. Dr. Patterson formerly was Lincoln Filene Professor of Citizenship and Public Affairs at Tufts University and was the staff director and a member of the Carnegie Commission on Educational Television.

The College now owns more than 500 acres of land in the towns of Amherst and Hadley, and is in the process of planning a campus and buildings. The architects, master planners, and architectural consultant are, respectively Hugh Stubbins and Associates; Sasaki, Dawson, DeMay Associates, Inc.; and Pietro Belluschi. Over half of the $24,500,000 needed to create the 1970 campus has been raised. Hampshire plans to have a student body of approximately 1500 by the middle of the 1970's and may expand in time to 3600 students.

The history and character of the early planning for Hampshire College are detailed in Working Paper Number One, The Making of a College, by Franklin Patterson and Charles R. Longsworth (Cambridge: The MIT Press, 1966). This volume which elaborates the intentions of Hampshire College, is not considered a static blueprint, but a thorough approximation of all aspects of the College's planning.

The Hampshire College program, as presently planned, introduces a number of departures from conventional academic procedures; among them a three-School academic structure instead of the more fragmented departmental arrangement, a flexible time schedule of three sequential Divisions in lieu of the usual four-year rule, and replacement of fixed graduation requirements based on prescribed course credits by a system of comprehensive examinations and independent research or creative projects. Time off campus will be encouraged for travel, work periods, independent research, and community service.

Hampshire College will undertake an innovative role in three broad interrelated realms of higher education. First, the College will seek, through continuing experimentation, consultation and review, to redesign liberal education so that

> . . . it better serves the growth in every human dimension--- intellectual, emotional, intuitive, sensuous - of those who comprise its community, and thus offers a more substantial ground for continuing self-education and self-expression;
>
> . . . it may be a more effective intellectual and moral instrument of responsibility for the quality of life in America.

Second, Hampshire will seek new ways of securing the economic viability of the private liberal arts college in an era in which the demand for quality education is confronted with rapidly rising costs.

Third, Hampshire intends to spur the further development of inter-institutional cooperation in education in the Connecticut River Valley of Western Massachusetts, thereby serving the interest both of educational vitality and sound economy. Hampshire will thus aim to demonstrate nationally the advantages of a regional complex of closely cooperating public and private institutions.

The rationale for these fundamental aims and some of the current working guidelines for their development are set out in The Making of a College. Since publication of that volume, further planning has resulted in the design of research and development programs in major areas of academic and extracurricular policy.

For example, the program of the School of Humanities and Arts will engage Hampshire's students in the active practice of the arts, leading them to join scholarship and performance, inquiry and expression. Workshops in dance, drama, and music will be developed; the bringing together of diverse art forms will be encouraged in student projects and performances; and special subjects will be introduced such as ethnic dance, folk and popular music, mythology and folklore. The School will emphasize visual awareness: through studies in the history and aesthetics of photography, film, and television and the understanding of these through active practice in them; and through a study of design, leading the student to an understanding of the power of visual forms to determine and give expression to his experience. He might consider the designs of chairs and pans, of automobiles and billboards, roads and streets, homes and buildings, and finally, the designs of cities.

As another example, the School of Natural Science at Hampshire, which is developing its science and mathematics curriculum through a grant from the

Sloan Foundation, has under consideration a program in human life science as a possible major component of its curriculum. The urgings and warnings of imaginative biologists such as Rene Dubos of The Rockefeller University make it clear that the study of human ecology can be neglected only at great risk to man and his future. Such a program would be interdisciplinary, and would draw upon the resources of the School of Social Science, especially if Hampshire should focus on psychobiology in accordance with a recommendation made by Dr. Frank Ervin of the Harvard Medical School.

A major subject of the Hampshire curriculum in all three of its Schools will be language. Hampshire intends the word in its widest sense, proposing that the student consider the great variety of special languages which men have evolved to communicate with each other and to lend form to their experience; and that he become alive to the problems of communication in our time, problems of change, inundation, and misunderstanding between men. In freshman seminars in "Language, Logic, and Value" the student may confront his native language as the enormously complicated syntactic, semantic, and pragmatic device it is. During second-term freshman seminars in "The Language of History" the student may consider, for example, narrative styles as indices and determinates of the historian's judgments and so of the history that is recorded. Other seminars concerned with language will be devised in all Schools of the College: e.g., the formal languages of mathematics and the computer, in the School of Natural Science; psycholinguistics, and the problems of the computerization of natural languages, and the cultural determinants of language, in the School of Social Science; and the languages of the mass media, of press, radio radio, and TV, in the School of Humanities and Arts.

Another specific area to receive intensive development is the integration of non-curricular with curricular student activities. In an attempt to combat the tendency toward fragmentation of life on campus, Hampshire College will seek means of bridging the gap between students and faculty, between students from middle class backgrounds and students from economically disadvantaged backgrounds, between psychological counseling and academic counseling, and between academic study and public service. The Carnegie Corporation of New York has underwritten the planning of these areas with a grant.

Hampshire College is explicitly designed to serve as a source of innovation and demonstration for American undergraduate education. The implications of this fact are threefold. First, while determined to avoid the kind of "laboratory school" role which so often compromises the institution's primary responsibility for its own students, Hampshire intends to develop and conduct its programs with a careful eye to their transferability: many of the lessons learned should be applicable to other settings. Second, the College will develop new techniques for self-evaluation, so that its experimenting character does not devolve into just one more narrow, rigid "experimental" orthodoxy. Third, through a continuing series of conferences, consultations, and publications, Hampshire will solicit other relevant experience and make widely known the results and review of its own efforts. The subtitle of The Making of a College - Working Paper Number One - implies a series of monographs dealing with different and successive aspects of the College's life as it unfolds.

II Review of Activities

There were four objectives in the first phase of this development of the concept of the experimenting and extended college library.

. . . Exploration of the configurations, functions, and operations of the academic library in transition.

. . . Initial analysis of the elements of such a library in the context of an experimenting institution, i.e. Hampshire College.

. . . Design of a building for these elements.

. . . Analysis and prediction of interlibrary cooperation within the five-college community.

To accomplish these ends, and in particular the design of the building, the first part of the project period was spent in deriving a sufficiently solid definition of functions so that a building could be designed. Two conferences were held to assist the project staff in this process.

(1) The Relationship of Information Transfer Systems and Experimentation to the Book Library (January 25-26, 1968)

(2) Planning for Automated Systems in the College Library (March 14-15, 1968)

An outline of the questions considered and a list of consultants at each conference are attached as Appendix A. Tapes were made of both conferences and are now being reviewed to determine the feasibility of editing them for publication.

In addition, consultants were brought to Hampshire College, (See Appendix A, 3) for discussion in the following areas of interest: the library and the educational process; media facilities and exploitation; integrating the library and the bookstore; library networks and cooperation.

Building design was completed in cooperation with the architects, Hugh Stubbins Associates, and consultants. The building will include, as integral parts of the Library, a book library, bookstore, display gallery, computing center, and information transfer (INTRAN) experimental center. Ground was broken for the building in November 1968. Within the constraints of economics and diversification of media and operations, we believe the design offers flexibility for innovation and experimentation.

By reviewing the functional components of the Library, one can see the way in which its design reflects the demands to be made upon it. One section, comprising the two lower floors of the Library, will house television and film studios, photographic and graphics workshops, experimental classrooms and laboratories in which to develop and test media; computer space; duplicating services; and facilities for connecting users to data banks and computer programs in other locations. Taken together, these features make up the Information Transfer (INTRAN) Center. The INTRAN Center, which is administratively integrated with the Library but which will have its own Director, represents the space, leadership, equipment, and commitment necessary to adapt to change and to develop experimentation with learning and with the Library.

The Center is the most visible evidence of a college-wide concern to use the new media in all relevant aspects of education. Among the functions of the INTRAN Center will be instruction in media preparation and use; analysis of the impact of media on the individual learning process; development of computer aids to education; assistance in the review and evaluation of the progress of the College; and encouragement to students and faculty to be more self-sufficient in the use of total library facilities. It will also be a place for creating, storing, and distributing materials in all media, a central nervous system linking the Library with the rest of the campus, and a place for students to learn the skills necessary to use the various technologies creatively. The INTRAN Center, then, is far more than a media resource center; it includes experimentation, educational involvement, and open-ended exploration of a more effective role of the Library in the college community.

Hampshire College's respect for the values of the book as an essential tool of our tradition is reflected in the fact that two-thirds of the total available space in the Library is designed for conventional library services. Even so, the design of this space allows for great flexibility in response to changing conditions. The other one-third of the space is specifically designed for new information-serving functions.

The book library is arranged for browsing in open stacks, as well as for easy maintenance by the staff. Processing by a commercial firm will reduce the amount of space customarily devoted to cataloging and processing and will free staff for services more directly related to users' needs. We expect commercial processing to reduce accessions costs considerably. The Library records will, from the beginning, be in machine-readable form. There will be space for 210,000 volumes, 50,000 microforms, 600 current periodicals and 10,000 non-book items.

Listening and viewing carrels, in sizes to serve individual students or small groups, are located near the reference collection and will be serviced from the circulation desk. Stack floors mix book shelving with carrels, small lounge areas for readers, and six faculty carrels.

The bookstore is located on a main traffic artery near the entrance of the building. It will be a direct extension of the Library, under Library management. As the automation of the Library catalog becomes feasible, the Library catalog will be combined with the record of the bookstore inventory, giving the user the option of buying or borrowing.

The display gallery is designed for exhibitions of everything from paintings to primary form structures, from rare books to computer-animated films, from light sculptures to kinetic art. It is located immediately east of the entrance to the building, with the central area of the gallery rising three stories high. One-story alcoves run around the gallery's outer edge for the exhibition of smaller displays; one alcove can be blacked out for films. The function of the display gallery is to suggest, to tempt, and to communicate in a public manner.

Underscoring the Library's role as the central meeting place for the campus and a center for communication is the location of the post office on its ground floor.

III Configurations and Functions of the Academic Library in Transition

Academic libraries built during the last third of this century will still resemble conventional libraries, but the resemblance may be misleading. This is because the definition of a library is changing rapidly, and will continue to do so for some time to come. The challenge, then, for new libraries is the creation of a new institution merging the best of the traditional library with a readiness to make maximum use of innovation in communications technology. They must, for survival, be prepared to offer conventional services, while at the same time experimenting with and changing those services.

Those responsible for college libraries are thus under increasing pressure to re-examine library processes and, more fundamentally, to reassess the reasons for the libraries' existence. They will be faced with an increasing number of critical decisions: to automate library processes; to standardize systems; to seek integration of book with non-book media; to develop cooperative agreements and networks; to use sophisticated communications systems; to become initiators in the educational process; to develop standards for analysis and evaluation of their own operations. Changes in technology, in curricular design, in costs, in types of students, in the services demanded, and in the patterns of learning are happening so fast that a critical change in libraries is imperative.

A library can no longer be only a sophisticated warehouse storing and dispensing knowledge to students who happen to come in its doors. Instead, the library must be a center for the creation, use and distribution of knowledge in a variety of media, communications-oriented rather than book-object-oriented.

To move from passive warehouse to dynamic process, several things are necessary. First, the library must contain not only books, but all forms of media relevant to the educational process. More importantly, these must be viewed not merely as additional packages to process and to store. Rather, these forms must be relevant and appropriate to the learning process. And the library itself must play an active role in this process. Second, the library must extend itself to responsibilities not normally included in the conventional library. The bookstore, audio-visual activities, computing services, and institutional research are a few of the elements that, together with the traditional book library, will strengthen each other. Third, and perhaps most important, the library must be open-ended. Because of the dynamics of communications technology, libraries must be designed and operated so that they are more adaptable to change than they are now. We do not know what demands will be made on the library in ten or twenty years, but we do know that they will be different than they are today. By 1990, it is likely, for example, that the excellence of the academic library will not be measured by the extent and quantity of its collections but rather by the capabilities of its information processing system and hence its response to user needs.

Within this context of innovation and change, the Hampshire Library has been designed to be a demonstration model for college library development and operation in the last third of the twentieth century. To serve as a prototype for the coming decades the Hampshire College Library will:

. . . combine book library, bookstore, computing center, display gallery, and Information Transfer Center.

. . . be the nerve center of the campus connecting the Library electronically with student rooms, faculty offices, classrooms, other libraries, and information processing networks.

. . . have its materials ordered, cataloged, and marked by a commercial firm so that staff energies may be directed toward help to the user.

. . . demonstrate the economies possible through the automation of library processes.

. . . experiment with student operation of the Library so that students, under professional guidance, will be serving their peers.

. . . explore and develop an active role for the Library in the teaching and learning process.

In short, we intend to create a dynamic and open-ended environment in the Library, from which the Hampshire student will develop a better sense of the organized complexity called communication. By becoming a more capable and sophisticated user of the new Library, a student will possess tools necessary to respond to two of the major challenges of this century, the information explosion and the revolution in communications technology.

The Hampshire College Library will be a pervasive and innovative force in the education of students. By recombining related activities on the campus and by separating the important from the trivial, the Library will be able to concentrate on the meaningful transfer, communication, and use of knowledge - for this is what libraries are all about. Further, like Hampshire College itself, the Library will be a catalyst for interinstitutional cooperation.

Within this context then, project activities were concentrated on the definition of problems and toward a preliminary analysis of the factors involved in change. In the first phase of this work, five problem areas have been isolated: interlibrary cooperation; library automation and processing; integration of media; effect of technological innovation on the library; and the function and organization of an experimenting library.

A. Interlibrary Cooperation: The Hampshire College Library in the Five-College Community.

The project staff, with consultants, has been concerned with isolating and defining those elements in library operations amenable to potentially fruitful cooperative efforts. To this end several areas are under study in the five-college area by project personnel: a survey of media services and systems; an analysis of the probable impact of Hampshire College on the libraries of the other four institutions; and a study of the behavior and status of library users in the present four academic libraries.

With the assistance of Professor Richard Trueswell, Chairman of the Department of Industrial Engineering at the University of Massachusetts, we have made a study of the impact of Hampshire College on the other academic libraries in this area (and vice versa). The approach of the study was primarily directed at the definition of the concept of impact as it relates to library operations. A function list was developed, intended to model all operations that might be affected by the emergence of Hampshire College.

A preliminary model was designed to predict the effect of a new college on other local libraries. (see separate report "A Study of the Impact of Hampshire College on the Libraries of the Four-College Community." February, 1969). The usefulness of such a model and its validity with respect to the actual situation is a function of two factors: (1) the representativeness by the model itself (in terms of the model's variables and mathematical terminology) of the real life situation; and (2) the input data that is used in the model when it is evaluated. Within limitations, we are satisfied that we have met the first criteria. However, there is a paucity of critical input data, such as the average number of library users per day in a student body of given size, or the circulation rate per library entry.

The model establishes an algorithm for predicting the number of potential and actual users from college i who will use the library of college j. Based on several assumptions and assumed data, an estimate is predicted of the increase in circulation and interlibrary lending caused by a new institution. Average data was used. In some cases the data were estimates by individuals closely associated with the problem.

Outside the scope of this model are a number of considerations concerning the effect of a new college on established libraries. These factors can be fruitfully analyzed in several different categories.

(1) Public Service

How much service can a reference staff give?

Should students receive instruction in library use, without specific location? How can this best be accomplished?

What will be the effect on interlibrary loan service among the libraries? There is already a daily messenger among the four libraries and an increasing load of loans, requiring screening and verification, may break an already overloaded system.

Will copying services be affected? If so, what is the effect on personnel and space planning?

(2) Space.

What is present and projected seating capacity of the libraries? Should regulations be established to control use of seats by students from other institutions?

(3) Control.

What effect will a new college have on loan procedures? What sort of regulations are necessary to guarantee access to materials by students of the home institutions?

(4) Acquisition Policies.

The libraries of the present four-college community have nearly 2,000,000 volumes in their collections. Is it feasible and economic to develop formal agreements on cooperative acquisition? HILC, the Hampshire Interlibrary Center (now sixteen years old and unrelated specifically to Hampshire College) has become a major and well-used repository for research materials. What should be its role in acquisitions?

(5) The Five-College Community.

It has become apparent, although our primary concern is Hampshire College in the community, that the problems really are not specific to the emergence of a new college. Consequently, it is expected that our study will probe rather deeply into the basic problems of five-college cooperation, and by implication, library cooperation in general. It is worth noting that there are almost 24,000 students presently enrolled in the four colleges, and this will probably grow to 30,000 by 1975. The emergence of Hampshire College, with a predicted enrollment of less than 1500 in five years will hardly cause a large wave. The question really becomes one of defining the catalytic nature of Hampshire in regard to library cooperation, and that becomes a political rather than a systems problem.

B. Automation and Processing of Library Materials

The library has been designed physically to exclude most technical processing normally done in libraries. This means that such processes will be accomplished outside the library. We are now reviewing the economics, systems, and relationship to automation of such an arrangement with a commercial processor.

In designing the library and in planning our future processing operations, we have five principal aims:

(1) to concentrate all orders for all types of materials through one channel and to eliminate as much as possible from internal operations the traditional acquisitions department.

(2) to eliminate as much as possible from our internal operations the processing of materials, i.e. cataloging, classification, card production, marking, etc.

(3) to simplify the invoicing process and to relate the incoming invoice directly to automated accounting procedures of the college.

(4) to be prepared from the beginning, to have machine readable copy to the extent that we can, when desired, pull records from Marc tapes or from any other available machine store.

(5) to be able, from the beginning to participate in automated cooperative efforts among the five college libraries.

An analytic approach to this problem will be highly useful to both new and old libraries who wish to eliminate the processing routines from their internal functions. There are, however, a number of questions to be considered.

What are the relative costs of in-house and outside processing? An intensive survey of the literature reveals a disappointing paucity of solid and useful cost analyses of these operations in existing libraries.

Are the delays which appear to be present in commercial processing tolerable? How can they be overcome?

What are the factors in integrating non-book materials in this process? There are obvious differences in acquiring non-book materials, as well as in the cataloging process. Are these differences too great to allow efficient integration?

Will a simple machine-readable record at this time be sufficient to guarantee a useful automated program at a future date? Or will we merely be postponing and insuring a massive key-punching operation sometime in the future?

C. Relationship of Book and Non-Book Materials in the Library

This will be a critical problem for libraries in the future and is a significant factor in this transition period. Because libraries must be concerned with the total problem of campus and indeed inter-college communication, attention must range across the whole variety of media, and messages. The physical design of the Hampshire Library supports this concept, principally through the Information Transfer (INTRAN) Center which makes up two floors of the building and is integrated administratively with the Library.

The INTRAN Center is an essential element in Hampshire's search for economic and educationally relevant solutions to the problems of undergraduate education. Hampshire cannot today reliably predict the applicability of technology to education for 1975 or 1985. Hampshire can, however, prepare itself for change. Response to change will come as experience, opportunity, and imagination allow Hampshire to experiment with the effects of technology on education, and in particular of technology on the Library. The INTRAN Center represents the space, leadership, equipment, and commitment necessary to adapt to change, as well as the opportunity to develop experimentation with the learning process and with the Library. The Center is the most visible evidence of a college-wide concern to use the new media in all relevant aspects of education.

Within this context, the INTRAN Center will have a number of functions.

(1) As a base for experimentation with communications technology, the INTRAN Center will confront the issue which Jerome Wiesner, Provost of MIT and a member of the Hampshire College National Advisory Council, has suggested is central to the application of technology to education: the man-machine interface. It will be the responsibility of the INTRAN Center to devise means of introducing it to the

uninitiated, demonstrating its potential, and training those who are interested in the necessary skills. The Center will also act as a laboratory for studying the impact of communications media on individuals.

(2) The INTRAN Center will be responsible for the development of computer applications to education. This will include the general area of computer-assisted instruction, and such specific areas as the use of computers to study natural language.

(3) In its efforts to make both rational and economic the administration of a college, Hampshire will use the facilities of the INTRAN Center to experiment with the collection and retrieval of much more information about the entire life of the college than is now generally available. Such information will provide the means to improve administrative effectiveness and to support research in the operation of a college.

(4) The INTRAN Center will concern itself with the development of means and materials to encourage students and faculty to be more efficient and self-sufficient in the use of library facilities, thus relieving highly trained librarians of routing question answering. Video, film, computer and manual displays offer a variety of presently unused possibilities to help the library user.

(5) The INTRAN Center, fully integrated with the Library, will also serve as a place for making, storing and distributing materials in all media. The key words are imagination and accessibility. The INTRAN Center staff must have a thorough awareness of its holdings and its production capacity, as well as an ability to relate a faculty request to them and an organizational style that minimizes obstacles to creative media use.

(6) The Center will also act as a central nervous system linking the Library to student rooms in the resident halls, classrooms, faculty offices, and administrative facilities. The INTRAN Center will act as a switching point to coordinate the campus use of closed-and open-circuit television and radio, and to access remote computer programs and data.

(7) The INTRAN Center will provide many opportunities for students to learn the skills necessary to use the various technologies creatively and to become intern staff members at the INTRAN Center. The students will thus be given a chance to participate in a central enterprise of the College, and encouraged to use the media facilities to produce curricular and other materials for themselves. The INTRAN Center will collaborate actively with the other four Connecticut Valley colleges in exploring the possibilities of information transfer. The aim will be economy and avoidance of duplication, moving toward a sharing - via

information transfer techniques - of Valley resources so that they may be made more accessible to all members of the interinstitutional community.

The INTRAN Center provides the basis for an analysis of a most significant extension of the Library, one which must become an integral part of library operations in the future. It is obvious that, from the description above, the INTRAN Center as planned is far more than a media resource center. More importantly it encompasses experimentation, educational involvement, and creative exploration for students, faculty members, librarians, and administration. These are necessary ingredients for the dynamic and participatory library that must develop during the Seventies.

There are obviously many questions to be considered, defined, and analyzed as this process of integration proceeds. In the role of problem-stater, we are - and have been - principally concerned in isolating problem areas, together with the conceptual data, and evaluation requirements necessary for rational consideration and operational solutions.

D. The Effect of Technological Innovation on Library Design, Organization and Function.

We have received a small grant from the Educational Facilities Laboratories (EFL) in support of a study of this subject. Our principal concern in these and related areas is to isolate and define those problems facing new (and possibly older) college libraries today, and to anticipate the questions they must consider as they move beyond conventional systems and extend into non-book media.

The purpose of this study is to isolate and analyze qualitative methods and criteria for predicting technological change and to assess its effect on library building, functions, and organization. The EFL Conference in the Summer of 1967 on "The Impact of Technology on the Library Building" is an excellent starting point. However, we conceive the library (the college library at least) in a somewhat broader sense than does the report of that Conference. In our context, the library is not only a passive repository and switching mechanism, but also a dynamic participant in educational processes, both formal and informal.

Planning new libraries for both new and old institutions finds us capable of taking advantage of a vast array of technological innovations - and that is a fortunate position indeed. But we are faced with constant new advances and change. And we are forced to make decision now as to what we think the state of technology, and its acceptance and feasibility, will be in 1975 or even 1985. Our purpose then is less to predict specific innovation, although this may be an important by-product, than to develop methods for prediction and to design models for college library planning. Hopefully our experience can assist new college (possibly even old ones) in determining what their building requirements are, under a given set of curricular, economic, and local conditions.

There appear to be three general areas of concern.

(1) Communications Technology, including audio-visual communication and computers for routine library processing and information storage, retrieval and display. What are the problems - economic and structural - in obsolescence? in feasible devices?

(2) The Man-System Interface, including self-help, human question negotiation and acceptance of innovation.

What, for example, is the rate of change users will accept in a traditional institution such as a library? Will this rate of acceptable change be different for librarians, faculty members, and students? How can a building best be adapted to these (probably) different rates of adaption? How can a building be designed to encourage both service to users and experimentation.

Is it possible to begin to look upon a library less as a physical place and more as a network with a set of variable nodes scattered across a campus, or even campuses? What are the economic constraints? What is the effect of curriculum experimentation on library design and operation?

(3) Prediction of Technological Innovation and its impact on library building and functions.

Are there methodologies suitable for prediction? For example, the Delphi method developed at the RAND Corporation for predicting specific innovation. What are the constraints and weaknesses of these methods as they relate to building design problems?

E. The Experimenting Library

Together with the INTRAN Center, the concept of the experimenting library offers the opportunity to study and to experiment with the processes of communication and learning that take place in and through the Library. Recognition of the Library as an information processing institution, communications oriented rather than object-oriented, can do much to break down the usual barriers which exist between the library and the community it serves. With the Library a subject for controlled experimentation and observation, students and faculty may become not only aware of the problems facing libraries, but also of their own decision strategies as library users. It is likely to be a particularly effective method of learning if ways can be devised for student, faculty, and staff to learn together, and to apply their findings to such a central institution as the Library. The Library itself serves as a subject of inquiry and becomes, with the INTRAN Center, a laboratory in which the student can observe and test himself as both generator and seeker of knowledge.

Some approaches to experimentation have been discussed above in reference to the INTRAN Center. In one sense all of what we are proposing is a prelude to experimentation, because it is obvious that many experiments cannot be conducted until the College is operational. However, the areas of concern and their parameters can be defined in the period before September 1970 when the first students arrive. Some of these are really not experiments in the classic sense, but represent rather an analytic approach to innovation and to new configurations.

(1) Library and Bookstore

Instead of making the Bookstore merely an unrelated department of the Library, we wish to explore the eventual feasibility of combining the two operations. After all, both handle packages called "books" or "records" or "tapes." One lends; the other sells or rents. As the automation of the library catalog becomes more economic, it may be possible to combine the Library catalog with the Bookstore inventory. This would offer the user the option of borrowing or buying. As copying of non-circulating materials becomes more prevalent, the two systems would tend to merge.

(2) Student Operation of the Library. In The Making of a College the possible role of students as teachers and tutors is discussed. There is no reason why this concept cannot be extended to the Library. Student involvement and responsibility, under professional guidance, would help in directing student curiosity and energy toward experimental concern with the processes of communication and self-help which take place in the library. Our principal concern here is to define feasible functions for which students could take responsibility, design a small in-service training, and check with other libraries who may have a similar approach.

APPENDIX A

Hampshire College Library Conference
Amherst, Massachusetts
January 25-26, 1968

Relationship of Information Transfer Systems and Experimentation to the Design and Function of the Library

Tentative Outline of Problems

The questions posed below are suggestive rather than prescriptive. They are stated only to provide a convenient summary of some of the problems we think are important. Some questions are unanswerable, at least in the form in which they are stated. Answers to others we hope will provide a frame of reference within which we can function creatively.

A. INTER-MEDIA RELATIONSHIPS

1. Handling Problems

What special selection and cataloging problems exist with non-book media?

Do (or will) non-book media fit into the MARC system?

Can we physically integrate books and non-books in storage and still be practical?

Will physical integration really help "intellectual integration"?

What types of media can be stored "on line"? Is this possible in well-defined, high-use collections, e.g. reserves?

Should non-book materials circulate outside the library? On campus? Off campus?

Must AV materials be inspected after each use? How does this affect storage problem?

2. Accessibility

How do we search for materials in non-book form? for specific information?

What relationship does storage have to accessibility?

How can we protect the copyright of non-book materials?

Should we store a master tape and circulate only reproductions?

What role can the computer play in search and retrieval? What relationship can the computer have to dial-access systems?

3. Relationship of Print to Non-Print.

How can we best handle these various media so that they truly support educational objectives?

B. INTER-LIBRARY RELATIONSHIPS

1. Handling Problems

Should the valley have a union catalog for non-book materials?

How will inter-library loan policies affect such materials?

What is the role of duplication (and/or reproduction) in the inter-library loan process?

2. Accessibility

Should Hampshire College become the major center for these materials?

If so, what is the potential of "dial access" from off-campus?

What problems are raised by "dial-access" systems from remote, i.e. off-campus stations?

What is the role of remote computer access, both for library materials and for programs or data available at other locations?

C. INTER-PERSONAL RELATIONSHIPS

What is the library's role - and the librarian's - in encouraging the acceptance and use of non-book materials? Does this role differ for students and faculty?

1. Faculty

Assuming their efficacy, how can the use of non-book media and their integration with print be encouraged? In class? As extensions of the formal teaching process?

How can faculty be made aware of new materials of potential us to them?

Are there ways faculty can maintain current awareness in all media?

2. Student

Will student acceptance of non-book media depend primarily on the faculty? Or will the students, within the context of the INTRAN Center, put pressure on the faculty for such use?

What physical arrangements are best to enhance student awareness of the continuum from print to sound to image?

3. Experimentation

How can experimentation with communication processes and with the variety of media be used to enhance the learning process?

Can experimentation in this field be viewed as another media? As a "meta media"?

D. INTER-DISCIPLINARY RELATIONSHIPS

What will be the relationship of the INTRAN Center to the School of Language? Language carrels? Computational linguistics? Mathematics and logic?

To the School of Humanities and Arts? Film production? The study of iconographic and aural modes of cultural expression?

To the Natural Sciences? Computer programs and computer access?

To the Social Sciences? Data collections? Computer programs?

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APPENDIX B

Hampshire College Library Conference
Amherst, Massachusetts
March 14-15, 1968

Planning for Automated Systems in the College Library

Hampshire College is a new undergraduate college formed with the cooperative support of Amherst, Mount Holyoke, and Smith Colleges and the University of Massachusetts. Hampshire has two goals:

1. To experiment with innovative solutions to the problems of undergraduate education.
2. To demonstrate the educational and financial advantages of cooperative activity among four closely situated private colleges and a large public university.

In planning for a college whose first students will live much of their lives in the twenty-first century, Hampshire College proposes to develop a library which will, within economic constraints, take maximum advantage of technological innovation, both in the automation of its routine processes and through the use of new media in the information transfer process. Although there is a relationship between these two, we are concerned at this meeting principally with the automation of routine library processes. Such automation is of course not an end in itself. Its purpose is to provide the beginning elements so that users (faculty, students, librarians) will have easier and more complete access to knowledge and information in the library.

Two criteria are basic to decision in these matters, and both are of equal importance:

1. The systems should be economic. That is, they should not cost appreciably more than conventional systems. At the same time, they should provide desirable services and administrative data not available from conventional systems.
2. These systems should free the professional staff members from routines so that they can dedicate most of their time to students and faculty. We wish to have all librarians intimately associated with the teaching and learning processes, even to the point of offering courses, serving as tutors, and assisting in the design of materials for instructional support.

Several important facts should be kept in mind. The Hampshire College Library is starting off de novo. We are not afraid to experiment, if we are convinced that solutions will meet our two criteria. We will have students and faculty in 1970. Our systems must be operable at some level by that time. We are starting to build the collection now.

Within this context, the immediate question then becomes: What should we do now (a) to control our present acquisitions; and (b) to guarantee that we will have an economic and operable system in 1970? This requires that we design a system for 1970 and then work backwards to insure that we take appropriate steps now.

A general breakdown of areas of consideration follows:

1. How can the Hampshire College Library participate in the attainment of the objectives of Hampshire College?

2. What will a system look like in 1970?

   What will it do?

   What kinds of inputs will in require?

   What kinds of information will it produce?

   What will it cost in operations? in staff? in equipment?

3. What will its relationship be to the other institutions in the Amherst area. to the New England Universities Library Resources Processing System? to the MARC System under development by the Library of Congress?

4. What steps can the Hampshire College Library take now? Can we design the card format and input so that we can start immediately to put the order process in machine readable form? the serials records? the catalog process? What are the costs?

   Can we anticipate remote scanning of the catalog? When? Does this require producing machine readable records now? If so, what format? Is it economic for a small college library to have an automated circulation system? Can a circulation system have any other than local usefulness?

5. What is the role and cost of commercial processing within an automated system? Can we economically move everything but book selection and user services out of the library?

6. How can non-book materials (audio tapes, video tapes, films, records, slides, etc.) be brought into an automated system?

7. Can the systems model we are designing be utilized by other new institutions? by established institutions? by groups of institutions?

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APPENDIX NO. 1
to
INTERIM REPORT

Project No. 7-1180
Grant No. OEG 1-7-071180-4351

A STUDY OF THE IMPACT OF HAMPSHIRE COLLEGE ON THE LIBRARIES OF THE FIVE COLLEGE COMMUNITY

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ED026548

U. S. Department of
Health, Education, and Welfare

Office of Education
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The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore necessarily represent Official Office of Education position or policy.

U. S. DEPARTMENT OF

HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

TABLE OF CONTENTS

Report Summary
Preface: Project Background
I. Background and Philosophy of Hampshire College 1
II. Introduction 3
III. Methodology and Procedures 4
IV. Results 6
    A. Hampshire College Impact 6
    B. Library Functional Areas 13
    C. Five College Activities 16
V. Five College Library System Model 19
    A. Five College Model 19
    B. Potential User Population 20
    C. Actual User Population 24
    D. Exchange Students 29
    E. Circulation 29
    F. System Model Variables 32
    G. Example 33
VI. Summary: Conclusions and Recommendations 35

Appendix A. Hampshire College Projected Enrollment 38
Appendix B. Hampshire College Study Space Projection 39
Appendix C. Hampshire College Library Holdings Projections . . 40
Appendix D. Four College Course Registration (1962-Present) . 41
Appendix E. Inter-library Loan Statistics 42
Appendix F. Miscellaneous Statistical Data Four Colleges 43
Appendix G. Exchange Students Terminology 44

Report Summary

This study is an attempt to explore and predict the effect of the emergence of Hampshire College on the libraries of the four other institutions of the area. It is principally directed at defining the concept of impact on the operations and services of the five libraries. Through interviews, a list of potential problems was developed and library functions were isolated. The study reveals that an extremely complex situation already exists among the four operating libraries. Consequently the focus of the study was modified to adapt to the more generalized five-college situation and to the effects of each institution on the other libraries.

A five-college systems model is developed to reflect the major factors affecting book circulation, and the number of potential and actual users at any one of the five libraries. The predictive algorithm includes consideration of (1) potential user categories; (2) a validity factor signifying whether or not a given category may legitimately use a library; (3) an actual user index number to indicate the fraction of potential users who will in fact use a library; (4) a school distribution factor to indicate that portion of use estimated at any particular library; and (5) a circulation index number which gives the expected loans per user.

Using both estimated data and partially verified data, estimates are made of the impact of Hampshire College on the five-college community. Recommendations are made for consideration by the five colleges.

Preface: Project Background

The objective of this project is to provide an intellectual and empirical base for new departures in the relationship between the college library and its academic environment. Hampshire College, an experimenting institution, is the context. The library as an institution is in transition to new forms and new processes. The Seventies will be a critical period for this transition. This project is concerned with the isolation and analysis of five areas. 1. Cooperation among libraries and analysis of the impact of various levels of cooperation on the individual library. 2. Automation and processing of library materials and the effect on costs, staff, space, and function. 3. Relationship of book to non-book materials in the library, including interface problems, computer applications, library self-help, remote query and dial access, and the integration of varying media. 4. The effect of technological innovation on library design, organization, and function. 5. The library as a subject for experimental inquiry and as a focal point for institutional change. Within this context, the project will define critical areas of change, isolate problems amenable to analysis or experimentation, and develop fruitful models for evaluation of library systems.

I BACKGROUND AND PHILOSOPHY OF HAMPSHIRE COLLEGE

Hampshire College is a new independent, experimenting liberal arts college which will open for students in 1970. It is intended specifically as a national pilot enterprise for innovations of quality in American higher education. Hampshire was brought into being through the initiative of faculty and administrative leaders of four institutions in the Connecticut Valley of Western Massachusetts: Amherst, Mount Holyoke, and Smith Colleges, and the University of Massachusetts. Hampshire is the result of planning begun in 1958, and its establishment was approved by the trustees and faculties of its four neighboring institutions. The College now owns more than 500 acres of land in the towns of Amherst and Hadley, and is in the process of planning a campus and buildings. Hampshire plans to have a student body of approximately 1500 by the middle of the 1970's and may expand in time to 3600 students.

The history and character of the early planning for Hampshire College are detailed in Working Paper Number One, The Making of a College, by Franklin Patterson and Charles R. Longsworth (Cambridge: The MIT Press, 1966). This volume, which elaborates the intentions of Hampshire College, is not considered a static blueprint, but a thorough approximation of all aspects of the College's planning.

The Hampshire College program, as presently planned, introduces a number of departures from conventional academic procedures; among them a three-School academic structure instead of the more fragmented departmental arrangement, a flexible time schedule of three sequential Divisions in lieu of the usual four-year rule, and replacement of fixed graduation requirements based on prescribed course credits by a system of comprehensive examinations and independent research or creative projects.

Hampshire College will undertake an innovative role in three broad inter-related realms of higher education. First, the College will seek, through continuing experimentation, consultation and review, to redesign liberal education so that

> . . . it better serves the growth in every human dimension - intellectual, emotional, intuitive, sensuous - of those who comprise its community, and thus offers a more substantial ground for continuing self-education and self-expression;
>
> . . . it may be a more effective intellectual and moral instrument of responsibility for the quality of life in America.

Second, Hampshire will seek new ways of securing the economic viability of the private liberal arts college in an era in which the demand for quality education is confronted with rapidly rising costs.

Third, Hampshire intends to spur the further development of inter-institutional cooperation in education in the Connecticut River Valley of Western Massachusetts, thereby serving the interest both of educational vitality and sound economy. Hampshire will thus aim to demonstrate nationally the advantages of a regional complex of closely cooperating public and private institutions.

The rationale for these fundamental aims and some of the current working guidelines for their development are set out in The Making of a College. Since publication of that volume, further planning has resulted in the design of research and development programs in major areas of academic and extracurricular policy.

Hampshire College is explicitly designed to serve as a source of innovation and demonstration for American undergraduate education. The implications of this fact are threefold. First, while determined to avoid the kind of "laboratory school" role which so often compromises the institution's primary responsibility for its own students, Hampshire intends to develop and conduct its programs with a careful eye to their transferability: many of the lessons learned should be applicable to other settings. Second, the College will develop new techniques for institutional self-evaluation, so that its experimenting character does not devolve into just one more narrow rigid "experimental" orthodoxy. Third, through a continuing series of conferences, consultations, and publications, Hampshire will solicit other relevant experience and make widely known the results and review of its own efforts. The subtitle of The Making of a College - Working Paper Number One - implies a series of monographs dealing with different and successive aspects of the College's life as it unfolds.

II. INTRODUCTION

This study is a first attempt to explore and predict the effect of the establishment and operation of Hampshire College on the four other institutional libraries in the area. Prediction itself is an extremely complex problem, even when variables can be estimated within defensible ranges of values. The case studied here, however rests on variables, which though intuitively identifiable, are difficult to define and almost impossible to quantify meaningfully without further study.

We originally assumed that the impact of Hampshire College on the other libraries would be a major problem. It became evident as we progressed that an extremely complex situation already existed among the four operating libraries. Consequently, although we continued with the original objective (effect of Hampshire on the other libraries), the focus was modified to adapt the model to the more generalized five-college situation and the effects of each institution on the other libraries.

The study was principally directed at defining the concept of impact on the operations and services of the five libraries. A list of potential problems was developed with the aid of the library directors and staff of each of the colleges. In addition, library functions were isolated so that all library operations that might be affected by the emergence of Hampshire College were included. Each function was treated separately and an analysis was made of the anticipated effect of Hampshire on that function for each of the other four libraries.

Part III describes the general approach taken in this study, together with the presentation of some of the predicted data on Hampshire College. Part IV derives and discusses various factors of the impact of Hampshire College on the four other libraries.

Part V develops a five-college systems model and illustrates it with a range of possible values representing Hampshire College. Of necessity the model assumes present behavioral patterns in usage of libraries and current operating procedures. It has complete flexibility; however, it does not attempt to predict the possible effects of technological changes in communications, telefacsimile or on-line access, for example, or changes in the types of media stored in libraries.

The study is essentially an overall view, which isolates and defines problems in interlibrary relationships, develops a model for further exploration and refinement, and makes recommendations for consideration by the library community.

III. METHODOLOGY AND PROCEDURES

As a first step we collected data that would help define the size and scope of Hampshire College. Present predictions by the College indicate that during the first year of operation (1970-71) Hampshire will have approximately 250 students, 20 faculty members, and supporting administrative personnel. Figure 1 contains predictions for this and subsequent years and is based on information provided by Hampshire College. In effect Figure 1 defines Hampshire College's potential library user population. Thus the problem is primarily that of predicting the impact or effect of this potential user population on the other four libraries. Figure 2 gives predicted totals of seating capacity and holdings for the library of Hampshire College, including house libraries. It is taken from data found in Appendices B and C provided by Hampshire College.

We realized that certain data would be unavailable during the summer of 1968 when the study was started. Such additional data is necessary, for example, to determine user behavioral patterns more explicitly. However, our basic approach to the study was to examine the entire problem area and to develop conclusions and recommendations.

Discussions were held at each of the four libraries with the director and some staff members. The directors of the Hampshire Interlibrary Center (HILC) and the Forbes Library were also included on a more restricted basis. Our concern during these discussions was principally directed toward the isolation of the possible areas of difficulty and not with the magnitude of these anticipated difficulties. Copies of the annual reports for each library were also obtained.

In addition to the library staff personnel, meetings were also held with the Five College Coordinator, Mr. North Burn, with Mr. Lawrence Wikander, then librarian of the Forbes Library in Northampton, and with Mr. Jackson Lethbridge of HILC. Some of the data gathered during these meetings will be found in the appendices. Annual reports were reviewed and each of the functional areas within the respective libraries studied. In this report, an effort has been made to identify the sources of all statistical data.

Although emphasis was placed on the impact of Hampshire College on the other four libraries, we found that current growth and mobility of the four college population and increased enrollment in exchange courses by students already have a pronounced effect on student movement and direct inter-library use. This activity already occurs and affects substantially the operation of the libraries without Hampshire College's existence. Appendix D is a tabulation of the growth of the undergraduate exchange courses since 1962-63.

FIGURE 1.

Predicted Student & Faculty Growth at Hampshire College

Year	Students	Faculty
1970-71	250	20
1971-72	500	30
1972-73	750	45
1973-74	1,000	65
1974-75	1,250	80
1975-76	1,500	94

See Appendix A for expansion on these estimates.

FIGURE 2.

Hampshire College Library, Seating and Estimated Holdings

Year	Total Seating	Total Holdings (Books and Microforms)
1970-71	284	30,000
1971-72	309	42,000
1972-73	357	53,000
1973-74	382	64,000
1974-75	432	74,000
1975-76	482	83,000
1976-77	482	91,000
1977-78	482	98,000

See Appendices B. and C. for additional data.

IV: RESULTS

This portion of the report is divided into three sections. Section A is devoted to discussions of the material gathered in the interviews with the librarians and Section B to the analysis of the functional check list. Section C includes information pertaining to the five college cooperative course program and the activities relating to this program. We felt that this information should be included because of its magnitude and effect on overall library operations. Such data must be considered because it represents a significant factor in the interlibrary relationships among the institutions.

A. HAMPSHIRE COLLEGE IMPACT

There appeared to be three main areas of concern among the librarians and their staff members: circulation, professional services to library users, and availability of space.

1. Circulation

a. Inter-Library Loans (ILL)

The first area of concern was the anticipated increase of interlibrary lending due to Hampshire College. Figure 3 is a summary for 1966-67 of the interlibrary loans among the four institutions, excluding the Forbes Library, HILC, and transactions outside the valley.

FIGURE 3
Interlibrary Loan Summary, 1966-67

Loaned to:	Borrowed From:				
	Amherst	Mount Holyoke	Smith	University	Total
Amherst	---	276	381	408	1065
Mount Holyoke	360	---	258	214	832
Smith	435	268	--	474	1185
University	833	457	654	---	1944
Total	1628	1001	1293	1096	

(Note: in compilation, lowest reported figures are used. There are evidently different standards for counting loans in the four institutions.)

This figure shows, for example, that Smith lent 381 books to Amherst, and borrowed 435 from Amherst, and that Smith lent a total of 1293 books and borrowed 1185 books within the community.

For purposes of estimating impact, we developed an index figure from the data displayed in Figure 3, which can be used to estimate in an approximate fashion the effect Hampshire College will have on the ILL system. Figure 4 shows in tabular form the range of loans from each of the institutions to the colleges (Smith, Mount Holyoke, Amherst).

FIGURE 4

Derivation of Index Number for Interlibrary Loans

	(1) Range of Borrowing	(2) Average (rounded)	(3) % of Actual Student Body (range)
Amherst	276-408	350	(1200) 23-34%
Mount Holyoke	214-360	275	(1650) 13-22%
Smith	268-474	400	(2350) 12-20%
University	457-833	650	(10,600) 4-8%

(Based on 1966-67 figures)

Excluding the University, the index figure ranges from 12% to 34%, with 23% as a typical figure. In the table, the University is omitted as a recipient because (a) the size of the student body, and (b) the college figures are closer to the reality of Hampshire College. This basically states that, as a rough approximation, we can say that one college library borrows from another college library at a figure represented by 23% of the number of its undergraduates, based on 1966-67 figures. This must be used with caution because (a) the number of interlibrary loans is increasing, and (b) the number of students in the colleges is remaining approximately stable.

We feel that this index number of 23% can be used to provide an order of magnitude prediction of the ILL effect of Hampshire College on the other four colleges. Because of the newness of Hampshire and the excellence of the other collections, we can postulate that Hampshire College might be expected to borrow up to two times the index number for the period 1970-1976. Using this postulate Figure 5 illustrates the estimated ILL borrowing by Hampshire College.

FIGURE 5

Estimation of ILL borrowing by Hampshire College, 1970-1976

	(1) No. of Students Hampshire	(2) Total Est. ILL by Hampshire	(3) ILL Requests per College by Hampshire	(4) Est. Av. ILL Lending by each of four libraries	(5) % Increase of ILL Lending per College caused by Hampshire.
1970-71	250	460	115	1500	8%
1971-72	500	920	230	1600	14%
1972-73	750	1380	345	1700	20%
1973-74	1000	1840	460	1800	25%
1974-75	1250	2300	575	1900	30%
1975-76	1500	2760	690	2000	33%

Col. (2): No. of Hampshire students x twice the Index No. x No. of other Libraries (250 x .46 x 4 = 460)

Col. (4): Average ILL lending per institution is estimated at 1500 per year in 1970-71, with estimated increments of 100 per year.

Figure 5 tells us that, based on the assumptions discussed above, the number of ILL transactions at each college will increase by approximately 8% in 1970-71 due to the emergence of Hampshire College. Assuming no major variations, this could grow to a 33 % increase for each college library. This we see as a maximum and one which we feel is probably too high for the real situation. But we feel it is necessary to state this maximum, so that the possible magnitude of the problem can be appreciated.

The interlibrary loan figure is difficult to predict because of the number of unknown variables: type and demand of courses at Hampshire; development of collections at Hampshire aimed at curriculum satisfaction; changes in the nature of student library use behavior. However, we feel that the estimates presented in Figure 5 represent a fair, if maximum prediction.

b. Circulation Control

A second point was raised by the librarians concerning circulation, namely the difficulty of retrieval of books borrowed by persons from other institutions. The home borrower, because of administrative mechanisms and proximity, can be contacted directly and books returned quickly. However this is a difficulty at each library now. The emergence of Hampshire may increase the problem; it will not create it. It would seem that a more formalized procedure for the return of the books through the cooperation of the library administration at each of the four colleges would be helpful. For example, the possibility of returning books to any of the five libraries should be explored. Admittedly there may be problems here; but, as circulation systems tend to become standardized and possibly automated, we feel these difficulties can be solved.

A related potential difficulty is that of the faculty member who borrows on an unlimited scale, creating his own private collection for his students. With automated systems, this could be readily measured and controlled by establishing limitations on the number of volumes borrowed by faculty from another institution. The circulation librarian at Mount Holyoke College estimated that under 1% of the faculty loans at Mount Holyoke represent loans to non-resident faculty. This is probably not typical and it is expected that the rate would be higher at Amherst College or at the University. However in either case, it would seem this is a controllable difficulty and could be corrected if it did in fact arise.

We can expect an increase in circulation due both to the emergence of Hampshire College and to a predictable increase in library use by students. However, this depends on the circulation and use regulations established in the present four libraries. These factors will undoubtedly cause an increase in the Loan Desk work load at any one of the libraries and may in time cause a breakdown in present manual systems. We recommend that studies begin immediately directed toward the development of compatible automated circulation systems in the five libraries and for a borrower's identification card which can be used in all libraries.

c. Reserve Books

A third area of difficulty within the category of circulation is that of the use of reserve books. If non-home institution students are permitted to use the library and to use the reserve book collection it is possible that difficulties could arise during heavy use periods for certain volumes in the reserve collection. This question would have to be resolved on the basis of establishing some operating decision rules. We frankly feel that this problem could be adjudicated if and when it arises.

2. Professional Services to Users

A major area of concern in this category is the provision of reference services to Hampshire College students and faculty. The magnitude of this problem depends of course on whether or not Hampshire students will be permitted to use the other four libraries on an open basis.

Policy at the Amherst, Mount Holyoke and Smith Libraries limits entry to guests of resident students and to students taking courses on that particular campus. At present there are ways for undergraduates to enter any one of the college libraries either as valid or as pseudo guests. At the University, non-resident students may enter the library but are not permitted to borrow materials. The university Library reference service does not check inquirers for status, However, librarians at the University have implied that, as the reference load grows, it may be necessary to require identification and possibly to restrict admission. Faculty members of the four institutions have privileges at all the libraries. It is assumed that Hampshire faculty will have the same privilege. Because of the small number of Hampshire faculty (less than 100 by 1976), the possible increase in reference work load should not be significant, unless it should become concentrated at one library.

There are a number of options here. At one extreme, restrictions could be tightened and a careful check made of all persons entering any one of the libraries. At the other extreme, all restrictions could be lifted and all academic persons granted use and borrowing privileges at any library. The proposed new University Library will tend to absorb the present pressures of their students for space and professional assistance. There are of course gradations of privileges between these two extremes. For example, it might be possible that Hampshire students be permitted to use the other libraries on an open basis for the first three years (1970-1973). This could be justified as a friendly attempt to assist a new institution, with the provision that it could be terminated at any point when the load became too heavy. Another possible variation is that the Hampshire Library would support a part-time or full-time professional librarian at one or several of the other libraries.

If we assume open access by Hampshire students at all the libraries, some indication of the order of magnitude of use can be predicted. Data collected from studies at Lehigh University and Northwestern University indicate that the number of students entering the library building each day is approximately 25 to 40% of the total number of students enrolled. The figure tends to be less at larger schools and is approximately 21% at the

University of Massachusetts, based on current statistics. If the larger figure (40%) is used and certain assumptions made, a prediction can be made of the increased activity at the four college libraries due to Hampshire College students alone. The first year population of Hampshire College will be 250 students and therefore 40% of the figure would represent a total library traffic of 100 students per day, i.e. using any library.

The nearest college to Hampshire College is Amherst College. Applying the 40% figure to the student population (1200) at Amherst College would give a figure of approximately 480 Amherst students going to the library each day. Thus if all library-using individuals (40% of 250) at Hampshire College were to use only the Amherst library, there would be an increase of less than 25% in the number of student entries into that library. However, Hampshire College students will of course use their own library, and it is assumed they will also use the other three libraries.

Thus, with this reasoning and using maximum figures, it would appear reasonable to say that the Hampshire College students would not increase the number of individuals entering the Amherst library daily by more than 10%. A more realistic estimate for this increase would be 4%. This latter figure is derived by assuming equal distribution among the five libraries of 100 Hampshire student entries per day. Thus 20 entries might be expected at Amherst or an increase of (20/480 x 100) or approximately 4%. With 500 students enrolled at Hampshire this figure would grow to 8%. Using the same assumptions, at Smith College, the impact of Hampshire students would be $(\frac{20}{2500 \times .40}) \times 100$, or a 2% increase in users the first year and 4% the second year. Geographical proximity will of course play a role in the use of libraries.

We predict that sometime within the next ten years, it will be found more efficient to have the libraries open to all five college persons, be they student or faculty. This belief is predicated on better resource and personnel allocation among the five libraries, standardization and automation in lending procedures, the increasing numbers of students taking courses on campuses other than their own, and the consequent increasing difficulty of control.

3. Space (Study Hall Function)

The third area of concern expressed by the librarians was that of space (i.e., seating) requirements for students permitted to use their libraries. Some aspects of this problem have already been discussed in (b) above and general estimates made of the number of students entering the library daily, for any purpose. For example in 1970-71, the increase in traffic due to Hampshire College was estimated at 4% for Amherst and 2% for Smith, assuming open access.

The use by Hampshire students of the other four libraries for strictly study purposes seems highly remote during the first several years. During the first year (1970-71), for example, there will be more seats available in the Hampshire Library than there are students. Figures 1 and 2 show, that in 1971-72, the ratio of seats to students will be about .62; in 1972-73, .48; in 1974-75, .34; in 1975-76, .32. In addition approximately 90% of the student body will have single rooms, hopefully providing a desirable study environment without recourse to the library. We are aware that the reasons for library "study" take many forms; dating, socializing, desire to be in another place, etc., and we are unable to estimate the impact of these factors.

As the availability of special space and facilities (film and TV studio, graphics and photographic work areas, etc.) in the Hampshire Library become known, we may in fact note a reverse flow of students to Hampshire College. Again, significant factors causing such usage are presently unpredictable.

FIGURE 6
Seating Capacity in the Five College Libraries, 1968, 1973

Institution	Present Seating Capacity, 1968	Seating Capacity, 1973	Est. No. Grad. & Undergrad. Students, 1972-73
Amherst (not including departmental libraries.	700	700	1,250
Hampshire (includhouse libraries)	---	357	750
Mount Holyoke (not including departmental libraries.	600	600	1,700
Smith (Main and Science only)	1,380	1,380	2,600
University Main Departmental	1,300	3,100 750	18,000

Figure 6 shows for each college an estimate of the total number of of library reader stations now and in 1973 when the new University Library will be available. These figures are low, possibly by 10%, because we are unable to obtain the number of seats in departmental libraries, house libraries, and other similar types of study space.

4. Library Subject Specializations.

Undoubtedly one of the major factors in causing a student to go to another library is the unavailability of specific materials or the lack of coverage of certain subjects in his own library. This will undoubtedly be a problem for Hampshire College students. However, it is the intent of the Hampshire Library to build its collections in close cooperation with the development of the curriculum over the next several years. This means that, for 1970-71, the Hampshire Library will aim specifically to meet the requirements of the first year, not to build an all-encompassing collection of whatever size.

Over a period of several years, e.g. 1970-1974, we can anticipate certain subject strengths developing in the Hampshire College Library in addition to a basic collection. Curriculum design and definition at Hampshire is undergoing intensive scrutiny and discussion at this time. Consequently this report makes no attempt to describe library subject specializations. However, a rough definition of subject specialty for the Hampshire Library can be said to be "a collection of materials in a specific subject capable of satisfying most of the requirements of undergraduates undertaking independent study in that subject."

B. LIBRARY FUNCTIONAL AREAS

We felt that, as a part of this study, the preparation of a library function list (i.e., list of tasks, activities, and services) would be useful. This would be used as a check list in considering the whole problem of the impact of Hampshire College. Figure 7 lists these functions in five general categories. The comments that follow are brief because many of the items have been discussed in Part A above.

1. Storage and Circulation

The impact of Hampshire on most of the functions listed under this heading are dependent on whether or not Hampshire students will have user privileges in the other libraries. However, some consideration must be given to departmental library use and, in particular, any specific demands that might be made in some of the smaller departmental libraries. Here again, it would seem that extending the privilege of using these libraries on a limited basis should be done over a trial period, to be discontinued if necessary.

FIGURE 7.
Library Function List

I. Storage and Circulation
   1. Regular Collections
   2. Reserve Collection
   3. Periodicals
   4. Dissertations
   5. Stack Entry
   6. Rules and Procedures for Fines, etc.
   7. Departmental Library Use
   8. Hampshire Interlibrary Center

II. Professional User Service
   1. Reference Desk
   2. Interlibrary Loans
   3. Newsletters
   4. User Handbooks
   5. Special Notices on Periodicals
   6. Special Routing of Periodicals
   7. Copying Services
   8. Current Awareness Services
      a. Phone Calls
      b. Table of Contents of Journals
   9. Special Search Services
      a. Charge
      b. Free

III. Cataloging
   1. Monographs
   2. Serials
   3. Periodicals

IV. Study Halls
   1. Reading Room Seats
   2. Study Carrels (Student)
      a. Stacks
      b. Special Purpose
   3. Study Carrels (Faculty)

V. Acquisitions (Procurement)
   1. Accounting
   2. Acquisitions
   3. Bindery

Some estimate of total book circulation requirements by the students at Hampshire College can be made based on data from other college and university libraries. Figure 8, which illustrates such estimates, is based on data taken from the four college libraries. The figures for circulation were derived by multiplying the expected number of Hampshire College students by an index number of books circulated per student per year. Ranges of values are used for the index numbers in order to obtain representative figures. These are approximate figures and do not take into consideration increased usage that might occur because of independent study or other unpredictable factors.

FIGURE 8
Predicted Hampshire College Circulation Requirements

Year	Hampshire Students	General Circulation* (Range: 18 to 46 Books/student)	Total Circulation** (Range: 30-82 Books/student)
1970-71	250	4,500 - 11,500	7,500 - 20,500
1971-72	500	9,000 - 23,000	15,000 - 41,000
1972-73	750	13,500 - 34,500	22,500 - 61,500
1973-74	1,000	18,000 - 46,000	30,000 - 82,000
1974-75	1,250	22,500 - 57,500	37,500 -102,500
1975-76	1,500	27,000 - 69,000	45,000 -123,000

* Excludes reserve book, carrel circulation and ILL

** Includes all circulation, except ILL

See Appendix F for present four-college range of circulation.

Appendix A gives some indication of the number of Hampshire students who might be doing independent study requiring library use. The number ranges from approximately 22 in the first year to approximately 357 students in 1975-76. The effect of independent study by Hampshire College students on the four college libraries is extremely difficult, if not impossible, to estimate because of our inability to predict exactly how well the Hampshire College Library will satisfy the requirements of students doing independent study. It is reasonable to assume that the faculty members who guide students on independent study will work closely with the library in developing holdings necessary for use by these students. However, the determining factor is whether or not these students will be allowed to use the other libraries on an open basis.

2. Professional Services

Reference assistance and inter-library loans have already been discussed in Part A, 1 (b) above. Newsletter services, user handbooks, special notices on periodicals, etc. should be extended to the Hampshire College population under the same rules that they are presently extended to the other colleges and with the stipulation that unusually large numbers of requests may cause termination of the service. Copying services should, of course, be billed in whatever manner is currently in practice on each campus. If special reference services are required by Hampshire faculty such as extensive literature search, and if this service is normally available to resident faculty, then it would appear desirable to charge a fee for any extensive services of this nature.

3. Cataloging

It is anticipated that no difficulty would arise in this function as the result of the existence of Hampshire College.

4. Study Hall Function

This has been reviewed above.

Faculty carrels should not be provided for Hampshire faculty members in other libraries as a matter of course. Exceptional cases can be judged on their merits and adjudicated locally.

5. Acquisitions

No difficulties should be anticipated in this area. As cooperative acquisitions programs among the libraries evolve, which is happening now through HILC, areas of specialization will be strengthened. The Hampshire College Library would expect to participate actively in this process.

C. FIVE COLLEGE ACTIVITIES

As mentioned earlier in this report, it appears that the expected increase in student mobility because of five college course exchange activities will result in substantially larger effects on the libraries than that which might occur through the existence of Hampshire College alone.

Figure 9 shows the growth over the last five years of the total semester course registration under the four-college exchange program. It might appear that the magnitude of the registration is tending to level out as indicated by the figures for the past three years. However, a new Five-College Coordinator, Mr. North Burn, has been appointed and much of his activities will tend to increase opportunities for students to take courses on the other three campuses.

FIGURE 9
Exchange Courses, By Semester Course

Year	Quantity (Semester Course
1963-64	434
1964-65	456
1965-66	743
1966-67	721
1967-68	782
1968-69	1,000*
1969-70	1,500 - 2,000*
1970-71	2,000 - 2,500*

*These are estimates by Mr. North Burn, Five College Coordinator and are based on his judgment and awareness of the expected situation. Mr. Burn has stressed that these are estimates.

If the enrollments predicted by Mr. Burn for 1968-71 occur there will be a substantial number of students moving from one campus to another. Unless there is a major change in the educational philosophy that supports this interchange, the figures predicted by Mr. Burn will probably become reality. Under these circumstances, a rather extensive re-evaluation of the roles of the five college libraries must be undertaken. Presently students enrolled in courses at other institutions are permitted to use the library at the institution where the course is offered, but presumably only for materials related to the course. This, however, is extremely difficult if not impossible to enforce and essentially means that the student is a user of the library.

There is the possibility that, over a period of time, the libraries, because of the mobility of the students, will essentially become a combined library system having multiple locations, each retaining its own identity. Such a system would undoubtedly improve considerably the efficiency of operations of all library functions. Resource strength in particular fields, for example, could be located on certain campuses. In time this might create a situation in which some holdings could be shifted from one library to another.

There are, however, a large number of intermediate steps necessary before such a situation could become reality. For example, an extensive survey of present and anticipated library holdings and subject specializations is necessary. If such a study is to serve realistically for planning, then it must also be supported by an estimate of future faculty teaching and research interests at each institution. Realistically, however, a more amenable solution to these problems would be a union catalog representing the total library collection in the valley. This becomes more feasible as the potential for automation grows, at least for current holdings. In the long run such a union catalog would serve both the libraries and the users better than the present system.

The highly dynamic situation discussed here is difficult to predict because no standards of operation or prediction are available regarding the kinds of library services required by these students. It would seem that the most logical approach might be to permit students to use the libraries in whatever ways they find necessary. However, data must be collected on a continuing basis to determine the numbers, activities, and status of students using the libraries.

As a first step in this direction, personnel on this project will undertake two studies within the next few months. The first is a questionnaire survey to determine library use by students taking exchange courses in the Fall semester, 1968-69. The second is a survey in each library to determine use status, what he does in the library, with whom he consults, and the length of time he spends there.

The data collected in these projects have little value unless they are continued and used to provide information for decision making. We recommend therefore, that the kinds of data discussed above should be used in control chart fashion to compare current activity with the previous year's activity on a weekly or monthly basis thus giving an indication of trends in both local and outside student library use. Such an approach also has the advantage that control chart techniques can predict changes before they occur.

PART V: FIVE COLLEGE LIBRARY SYSTEM MODEL

The use of a mathematical model to describe any given system is a technique that is of considerable value in determining and predicting the system's characteristics. However, the usefulness of such a model and the validity of the model with respect to the actual situation is a function of two items: (1) the representativeness by the model itself (in terms of the model's variables and mathematical terminology) of the actual real life situation, and (2) the input data that is used in the model when the model is evaluated. First we need a model that represents the system and second the validity of the results depends on the validity of the input data.

Two broad approaches are often made in model use. The first is computer simulation whereby frequency distributions of the actual data are used along with a random number generating technique such that many "simulations" of the actual phenomenon are generated by the computer. The concept behind this approach is that the cumulative distribution function represent the actual real life situations and as such, approaching them from a random point of view, will give more significant and more accurate results than using average data. However, the feasibility of using this approach is dependent upon the availability of both the data and the computer itself. Manual simulation is possible but is extremely cumbersome and time consuming. The second approach to model building is the use of average data and the evaluation once of the model by hand or even by a computer, but in the latter case without simulation.

The approach taken in this report will use average data because of the present unavailability of the kinds of data necessary for computer simulation. The computer simulation approach could be made at a later date using variations of the same equations developed for the manual approach. Data collection made during the academic year and data collected at other libraries will help to provide an input for an eventual computer simulation of the model itself.

A. FIVE COLLEGE MODEL

The model that has been developed for this report is an attempt to reflect the major factors affecting circulation, and the number of users at any of the five college libraries. The approach has been one of a general or flexible concept rather than one of limiting the model to a single library within the five college area. Thus, with this approach, it is possible to predict the effect on one of the colleges by any one of the other colleges in the five college community. It must be stressed at this point that complexity of the model is necessary so that it will reflect or "model" the actual situation. The data used in the present illustrative calculations will be in many cases average data. In some cases they will be estimates by individuals closely associated with the problems involved. The model has sufficient flexibility to permit its application to a system similar to the five college libraries but for varying numbers of people, colleges, and universities. However, any extrapolation of this model to presumed "similar" situations should be done with caution and with careful evaluation of the true equivalence of the two systems.

Potential users for any library will be defined as those individuals who may legitimately enter the library and use any of the services or facilities within the given library. For example, individuals who are permitted to enter the library but not to borrow books, will be counted as potential users.

The definition of terms is extremely important in any approach to model building. The following, therefore, are defining terms to be used eventually in the model itself. Mnemonic terminology has been utilized wherever possible and the subscripts i and j are typically used to convey activity on a "from" and "to" basis respectively. For example, C_{ij} represents the circulation per year at library j caused by any of the users of library j who are from school i. Note that the subscript term i really represents different categories of individuals such as faculty, students, staff, etc. all located at school i.

The following terms will be used in the model, each one representing a User Category Population.

F_i = number of faculty at school i (i = 1 to m)
G_i = number of graduate students at school i (i = 1 to m)
U_i = number of undergraduate students at school i (i = 1 to m)
S_i = number of staff members at school i (i = 1 to m)
O_i = number of others at school i (i = 1 to m)
(spouses, children, etc.)

NOTE: The sum of the terms F_i through O_i for any one school represents the total population associated with that school. "m" represents the number of schools considered.

B. POTENTIAL USER POPULATION

As a start in developing the model, it is necessary to consider the potential user population coming from each source to a given library. This potential user population is made up of the categories described above.

Thus we could define P_{ij} as representing the number of potential users from school i who could legitimately use library j. In the extreme or maximum case P_{ij} equals the total of all user groups at school i.

$$(1)\quad P_{ij} = (\text{User Category Population}) \times (\text{Validity Factor})$$

Equation (1) represents in verbal notation the potential users of library j from school i. Note that P_{ij} is equal to the product of the quantities of people in each user category multiplied by a validity factor of zero or one. This validity factor indicates whether or not the people in the category are allowed to use library j (e.g., yes = 1; no = 0). A factor of zero indicates use not allowed and a factor of one indicates that individuals in the user category may use the library. As an example, part of this population would be made up of faculty members from school i who could legitimately use the library at school j. Under present rules, the undergraduate students at any of the four institutions may not use the library at another school (except under special conditions).

Equation (2) illustrates algebraically the relationship of equation (1), when applied to all categories. Each of the lower case factors in equation (2)

$$(2)\quad P_{ij} = (F_i \times f_{ij}) + (G_i \times g_{ij}) + (U_i \times u_{ij}) + (S_i \times s_{ij}) + (O_i \times o_{ij})$$

represent the corresponding validity factor for each of the user category populations.

Figure 11 is a table of typical values for user validity factors representing all categories. Note for example, because faculty of all of the five colleges are permitted to use any one of the five college libraries, the table for f_{ij} contains all ones. However, the graduate student user validity factor table contains only a diagonal of ones and all remaining entries in the table are zeros except for U. Mass. which allows entry of graduate students from all schools. A similar situation exists in the user validity factor for undergraduates and staff.

Thus it is possible in any of these tables to reflect the rules governing the use of the libraries by the various categories of individuals in the system. It is also possible to change these rules, and consequently the table values, and to determine the effect of the potential user population from any school on the library of another school.

FIGURE 11

Faculty User Validity Factor Matrix

f_{ij}

From	To				
	A	H	MH	S	UM
A	1	1	1	1	1
H	1	1	1	1	1
MH	1	1	1	1	1
S	1	1	1	1	1
UM	1	1	1	1	1

Graduate Student User Validity Factor Matrix

g_{ij}

From	To				
	A	H	MH	S	UM
A	1	0	0	0	1
H	0	1	0	0	1
MH	0	0	1	0	1
S	0	0	0	1	1
UM	0	0	0	0	1

Undergraduate User Validity Factor Matrix

u_{ij}

From	To				
	A	H	MH	S	UM
A	1	0	0	0	1
H	0	1	0	0	1
MH	0	0	1	1	1
S	0	0	0	1	1
UM	0	0	0	0	1

Staff User Validity Factor Matrix

s_{ij}

From	To				
	A	H	MH	S	UM
A	1	0	0	0	0
H	0	1	0	0	0
MH	0	0	1	0	0
S	0	0	0	1	0
UM	0	0	0	0	1

Other User Validity Factor Matrix

0_{ij}

From	To				
	A	H	MH	S	UM
A	1	0	0	0	0
H	0	1	0	0	0
MH	0	0	1	0	0
S	0	0	0	1	0
UM	0	0	0	0	1

It should be noted that equation (2) represents a single entry in a table, Figure 12, of the total potential users who may legitimately use the library at school j and who come from the population at school i. Thus if one wishes to know the total potential user population for a given library, he would sum the values in any one column of this table. For example, if we wish to determine the potential user population for any one of the libraries, say Amherst, from all the colleges, this could be done by adding those entries in the column for Amherst, i.e. 5,100 potential users.

FIGURE 12 (P_{ij})

Potential Users (Quantities for Illustrative Purposes Only)

From	To A	H	MH	S	UM
A	3000	300	400	400	2,500
H	50	500	70	150	300
MH	200	200	3400	400	3,000
S	250	250	450	4200	3,600
UM	1600	1900	1700	2100	16,000

The total potential user population for a given library is given by Equation (3) which represents the number of users at library j caused by all potential users. The equation represents the sum of the totals of the jth column in table P_{ij}. (Figure 12)

$(TP)_j$ = total potential users at library j

$$(3) \quad (TP)_j = \sum_{i=1}^{i=m} P_{ij} = \sum_{i=1}^{i=m} (F_i \times f_{ij} \ldots\ldots + O_i \times o_{ij})$$

C. ACTUAL USER POPULATION

Potential users, however, give us only the extreme case of actual use. It is necessary now to define actual users. These we define as the number of individuals who enter the library for any purpose and includes those who are permitted to use the library but not to borrow books. The prediction of the actual users can be made by looking at historical data for the given library or historical data for other "comparable" libraries. For example, we might find in a body of 100 faculty members (potential users) that only 60% use a library, or are library users, during a given time period. Persons entering twice during the time period would be counted as two users.

One approach is to use an index number as a multiplier of the potential users. For example, an index number (Figure 13) may be computed (from historical data) that shows the actual number of users entering the library per day to be a percentage (or fraction) of the total number of potential users for the library.

FIGURE 13

Actual User Index Number

f'_i	1 A	2 H	3 MH	4 S	5 UM
1 A					
2 H	.125	.125	.125	.125	.125
3 MH					
4 S					
5 UM					

Note: As with the User Validity Factor shown in Figure 11, there would be a matrix or table for each category. However only the table for faculty (f'_i) is shown here. The values in the tables represent the index numbers for actual library use by the potential user population at a given school for a given category of user per day.

For example, if an average of 3,000 entries are made to the library per day and if the potential user population is 24,000 we have an index number of 3,000 divided by 24,000 or approximately .125. Note that this example is for the total of all user categories because it does not distinguish between types. Each user category should normally be treated separately. However data are not presently available for this. The model is, however, designed to use this data when they become available.

Careful analysis of other research studies of library user behavior will permit the compilation of index numbers similar to the case above which will apply to the various categories of users described in equations (2) and (3). Thus the number of actual users in each category using any library is the number of potential users times this index number.

However, this formulation and approach does not indicate what percentage of these users will use a given library merely estimates the users using any library. Thus, if the above index number is used and the actual users computed, we are obtaining a maximum number of users for any one library and we are assuming that all of the possible users of a given library will use that particular library. Therefore, it is necessary to predict in some way what percentage of these maximum actual users could be expected to use any one of the libraries under consideration. Thus some form of library distribution percentage factor must be used. All of these factors are defined in Section F below.

Equation (4) indicates verbally the actual users of library j caused by the population at college i.

$$(4) \quad A_{ij} = P_{ij} \text{ x (actual user index number) x (distribution factor)}$$

Note that two new multiplier factors are used: namely, the actual user index number and a college distribution factor. To simplify the expressions mathematically and still maintain mnemonic terminology, a prime has been used in equation (5) to indicate algebraically the actual user index number and a double prime to indicate the college distribution factor. Equation 5 is a term by term compilation of equation (4).

$$\begin{aligned}(5) \quad A_{ij} &= \text{Actual users from school } i \text{ using library } j\\ &= (F_i \times f_{ij} \times f'_{ij} \times f''_{ij}) + (G_i \times g_{ij} \times g'_{ij} \times g''_{ij})\\ &+ (U_i \times u_{ij} \times u'_{ij} \times u''_{ij}) + (S_i \times s_{ij} \times s'_{ij} \times s''_{ij})\\ &+ (O_i \times o_{ij} \times o'_{ij} \times o''_{ij})\end{aligned}$$

In an effort to clarify the terminology in equation (5), let us look only at the faculty category on a term by term basis as described in Equation (6). At the lower end of each arrow is a description of what has been computed up to that point in the equation.

$$(6)\quad \begin{array}{l}\text{Faculty users}\\ \text{from school i}\\ \text{using library j}\\ \text{per day.}\end{array} = \underset{\begin{array}{l}\text{No. of faculty}\\ \text{at school i.}\end{array}}{F_i \Big\downarrow} \times \underset{\begin{array}{l}\text{No. of faculty at school}\\ \text{i who may use library j.}\end{array}}{f_{ij} \Big\downarrow}$$

$$\times \underset{\begin{array}{l}\text{No. of faculty at}\\ \text{school i using}\\ \text{library j if all}\\ \text{uses were at lib-}\\ \text{rary j.}\end{array}}{f'_{ij} \Big\downarrow} \times \underset{\begin{array}{l}\text{No. of faculty}\\ \text{at school i}\\ \text{using library j}\end{array}}{f''_{ij} \Big\downarrow}$$

In equation (6), f''_{ij} is the school distribution factor, which is a percentage (or fraction) of actual users from school i who will actually use library j. This information would be prepared as shown in Figure 14 where we have tables of the various use categories, indicating the fraction of the total number of uses for each library that will be made by the individuals from a given school. It should be noted that in the tables of Figure 14, the rows will sum to 1.0 indicating that all library use by the population at a given school will be restricted to the libraries indicated. In the special category of x_{ij} (explained later) for exchange students, actual course enrollments will be used.

The factors found in Figure 14 must be determined in some predictive way. Intuitive ranking or judgment may be used. For example, some individuals in each category could be asked to estimate the percentage of use of each of the libraries by the users from a specific school. Thus to prepare the tables for f''_{ij} in Figure 14, the question would be phrased as follows: estimate the percentage of users of the library by the faculty at school i that will occur in each of the libraries in the row for school i. For example, the second row in the table for faculty (f''_{ij}) indicates that 15% of library use by faculty at school no. 2

FIGURE 14
Distribution Factor

f''_{ij}	1 A	2 H	3 MH	4 S	5 UM
1 A					
2 H	.15	.7	.05	.05	.05
3 MH					
4 S					
5 U					

u''_{ij}	1 A	2 H	3 MH	4 S	5 UM
1 A					
2 H	.03	.90	.01	.01	.05
3 MH					
4 S					
5 U					

s''_{ij}	1 A	2 H	3 MH	4 S	5 UM
1 A					
2 H	.01	.95	.01	.01	.02
3 MH					
4 S					
5 UM					

o''_{ij}	1 A	2 H	3 MH	4 S	5 UM
1 A					
2 H	.01	.95	.01	.01	.02
3 MH					
4 S					
5 UM					

Note: These tables represent the fraction of total library use by each college that will occur at a given library. Thus f_{ij} is the fraction of the total library use by the faculty of school i that will occur at library j. Entries of approximate estimates have been made for Hampshire College users at other libraries, for illustrative purposes only. Graduate student (g'') has been omitted since there will be none at Hampshire.

would occur at the library of school no. 1, 70% at its own library (school no. 2) and 5% each at schools 3, 4, and 5.

Another approach for determining the distribution factor is possible in which a sampling of faculty members, librarians, and students would be selected and asked to estimate the entries for the tables. Each would be asked to express as a ratio the expected number of times he would use another specific library compared to the number of times he would use his own library.

FIGURE 15

Library Use Distribution Factor for University of Massachusetts Faculty

(Example)

Library				
1 (A)	2 (H)	3 (MH)	4 (S)	5 (UM)
1/1000	1/20	1/100	10	1.0
.001	.05	.01	10	1.0 =Row total=11.061
.001	.05	.01	10	1.0
11.061	11.061	11.061	11.061	11.061
.00095	.0452	.00095	.95	.0095 = 1.0

Note: the figures indicate the fraction of library use by the UM faculty that would occur at each of the libraries indicated.

Thus line 1 in Figure 15 shows the ratio of the approximate number of times a given library is used relative to the number of uses of the home library. A person might enter in Figure 15 the fraction 1/15 indicating that he would use his own college library 15 times more frequently than the given library. If one library is used very rarely, perhaps he might use the ratio 1/1,000 indicating that for every 1,000 uses of his own library he might use this other library once. Thus, some estimated figures are shown in Figure 15 for library 5 (UM). The example shows that the Smith College (4) library is used ten times more frequently than library 5. This might be caused by some particular characteristics of the collection or physical location, etc. Thus the first row of figures in Figure 15 would be supplied by the sampled participants and calculations would be made as shown to determine the weighted use of other libraries for the particular category and library.

These factors could then be used as school distribution factor multipliers: namely, the double prime multipliers found in equations (5) and (6). It should be noted that the school distribution factors shown in Figure 15 are for University of Massachusetts faculty only and that data for all other schools and categories should also be prepared in a similar manner.

D. EXCHANGE STUDENTS

Data on exchange students (students taking courses on a campus other than their home institution) require some special consideration for use in the system model. The sub population of exchange students would be considered an additional population generating library requirements at the school where they are enrolled for exchange courses. These requirements would be above the students' normal library requirements and therefore the exchange students would be counted in the categories both of graduate or undergraduate students and of exchange students.

The terms listed in Appendix G could be used directly in the system model except for the exchange student factor in the calculation of circulation (based on potential users). In this calculation of circulation, the multiplier x''_{ii} would be used as explained below to define exactly the potential users. This is necessary because students are permitted to use only the library at the institution where they are taking an exchange course. Thus the potential user population for exchange students is determined from the registration figures.

E. CIRCULATION

There are two parameters that may be used for predicting circulation at a library. The same basic method applies for each, but the index number base may be either the actual users expected at the library or the potential user population. Equations 7A and 7B verbally represent these two approaches in predicting circulation.

(7A) C_{ij} = (Potential Users) x (Potential User Circulation Index Number)

(7B) C_{ij} = (Actual Users) x (Actual User Circulation Index Number)

The user circulation index numbers, whether based on actual users or potential users, will be determined from data collected at some of the Five College libraries and other libraries throughout the country. We, of course, realize that the appropriateness of any of these circulation index numbers is a function of the similarity and comparability of the library from which these index numbers were obtained to the libraries being modeled. Examples of the tables for circulation index numbers used in equations 7A and 7B will be found in Figures 16 and 17 respectively.

FIGURE 16

Potential User Circulation Index Number

f'''_{ij}	1	2	3	4	5
1					
2					
3			82 books/yr.		
4					
5					

Note: This is the average number of books per year or per day borrowed by each potential user, i.e. annual circulation divided by the number of potential users.

Only one table and one typical value is shown (faculty) but in actuality a separate table of values exists for each category.

It should be noted as shown in equations 8A and 8B that the user circulation index numbers, although identified by categories such as faculty, graduate students, etc., will be difficult to evaluate when describing circulation by individuals from a given school at one of the libraries under consideration. However, this characteristic which offers considerable flexibility will be built into the model and in some cases values may be obtainable through special data collection. It should be noted that the numerical values for the circulation indices (f'''_{ij}) would be different numerically although the same term is used for simplicity in equations 8A and 8B.

$$(8A) \quad C_{ij} = P_{ij} \text{ x (Potential User Circulation Index \#1)}$$

$$C_{ij} = (F_i \text{ x } f_{ij} \text{ x } f'_{ij} \text{ x } f''_{ij}) + (G_i \text{ x } g_{ij} \text{ x } g'_{ij} \text{ x } g''_{ij})$$

$$+ (S_i \text{ x } s_{ij} \text{ x } s'_{ij} \text{ x } s''_{ij}) + (O_i \text{ x } o_{ij} \text{ x } o'_{ij} \text{ x } o'''_{ij})$$

$$+ (X_j \text{ x } x_{ij} \text{ x } x'_{ij} \text{ x } x''_{ij} \text{ x } x'''_{ij})$$

(8B) $C_{ij} = A_{ij} \times$ (Actual User Circulation Index #1)

$$C_{ij} = (F_i \times f_{ij} \times f'_{ij} \times f''_{ij} \times f'''_{ij}) + (G_{ij} \times g_{ij} \times g'_{ij} \times g''_{ij} \times g'''_{ij}$$

$$+ \ldots\ldots\ldots (O_{ij} \times o_{ij} \times o'_{ij} \times o''_{ij} \times o'''_{ij})$$

$$+ (X_i \times x_{ij} \times x'_{ij} \times x''_{ij} \times x'''_{ij})$$

Note that the C_{ij} in equations 8A and 8B represent entries in a table. From these entries, it would be possible, for example, to predict the number of books that will be borrowed by the faculty of Smith College from the library at Mount Holyoke College. Similarly, other categories or groups of categories would be possible. It should be noted that data found in Figures 16 and 17, for all practical purposes, may be constant for all entries in a given category table.

FIGURE 17

Actual User Circulation Index Number

f'''_j	1	2	3	4	5
1					
2					
3	.73 books circulated per actual entry				
4					
5					

Note: This is the average number of books borrowed per year or per day by an actual user, i.e., annual circulation divided by annual users of the library.

Only one table and one typical value is shown (faculty) but in actuality a separate table of values exists for each category.

The system model described here has sufficient detail to permit considerable flexibility in examining and evaluating many combinations of the factors and populations affecting library use. Its major emphasis is to provide complete detail for greater flexibility.

F. SYSTEMS MODEL VARIABLES

Title of Variable	Symbols Used	Units
1. Validity Factor: this is a zero/one number indicating that the corresponding population at school i may or may may not use the Library at school j (zero means no use, one means legitimate use)	f_{ij}, g_{ij}, u_{ij} s_{ij}, o_{ij}, x_{ij}	Pure number 0/1
2. Actual User Index Number: this is a number (less than 1.0) that indicates that fraction of the potential users of a library who will actually use any library during a given time period. It is for each user category and for each school.	f'_{ij}, g'_{ij}, u'_{ij} s'_{ij}, o'_{ij}, x'_{ij}	Actual users/ day/potential user.
3. School Distribution Factor: this is a fraction that indicates that portion of the use which will be at each of the libraries, by those individuals from a given school.	f''_{ij}, g''_{ij}, u''_{ij} s''_{ij}, o''_{ij}, x''_{ij}	Pure number in Decimal form.
4. Circulation Index Number: this is an index number that gives the expected average circulation per user. It can have either potential users or actual users as a base and would have different values in each case.	f'''_{ij}, g'''_{ij}, u'''_{ij} s'''_{ij}, o'''_{ij}, x'''_{ij}	Circulation per day per user.

G. EXAMPLE

It must be stressed that the values found in the tables and the values used in these calculations are estimates and are subject to the collection of additional data and to the review of policy regarding use of the libraries by other than resident students. Values placed in the tables are for illustrative purposes only.

The example illustrated will be the effect on Amherst College by the students of Hampshire College. The following initial values of population are assumed for Hampshire College in its second year of operation, 1971-72:

$F_2 = 30$ (faculty)
$G_2 = 0$ (graduate students)
$U_2 = 500$ (undergraduates)
$S_2 = 20$ (staff)
$O_2 = 100$ (other legitimate users)
$X_2 = 200$ (Hampshire students taking courses on other campuses)

1. Potential User Population (Assuming all user categories are allowed to use the library). Note that the subscript numbers refer to the five colleges when they are listed in alphabetical order, e.g. subscript "1" is Amherst College, subscript "3" is Mount Holyoke College, etc.

P_{21} = Potential User population from Hampshire College (2) to the Amherst College (1) library

$$= (F_2 \times f_{21}) + (G_2 \times g_{21}) + (U_2 \times u_{21}) + (S_2 \times s_{21}) + (O_2 \times o_{21}) + (X_2 \times x_{21})$$

$$= 30 \times 1 + 0 \times 1 + 500 \times 1 + 20 \times 1 + 100 \times 1 + 200 \times 1$$

P_{21} = 850 Potential Users of the Amherst Library from Hampshire College

2. Actual User Population: Expressed in users/day with an average value value for $f_{21} = g_{21}, u_{21} \ldots$ etc. = .125 users/day (see Figure 13)

A_{21} = Actual User population from Hampshire College to the Amherst College Library.

$$= (F_2 \times f_{21} \times f'_{21} \times f''_{21}) + (G_2 \times g_{21} \times g'_{21} \times g''_{21})$$

$$+ (U_2 \times u_{21} \times u'_{21} \times u''_{21}) + (S_2 \times s_{21} \times s'_{21} \times s''_{21})$$

$$+ (O_2 \times o_{21} \times o'_{21} \times o''_{21}) + (X_2 \times x_{21} \times x'_{21} \times x''_{21})$$

$$= (30 \times 1 \times .125 \times .15) + (0 \times 1 \times .125 \times 0)$$

$$+ (500 \times 1 \times .125 \times .03) + (20 \times 1 \times .125 \times .01)$$

$$+ (100 \times 1 \times .125 \times .01) + (200 \times 1 \times .125 \times .25)$$

$$= .56 + 0 + 1.88 + 0 + .125 + 6.25$$

A_{21} = 8.815 or Approximately 9 Hampshire College Users/Day at the Amherst College Library.

3. Circulation

(a) Potential User Base (Equation 7A)

Note that each individual category could have its own circulation factor as indicated in Figure 15. A sample calculation is not made here because there are no reasonable estimates available for the circulation coefficients.

(b) Actual User Base (Equation 7B)

C_{21} = Circulation at Amherst College Library caused by Hampshire College.

$= A_{21} \times$ (circulation factor)

$= 9 \times .73 = 6.57$ vols/day* or approximately vols/week

*The figure .73 is from a study at Lehigh University which indicated that a library user charged out .73 volumes each time he entered the library. Note that in actual use, this figure (.73) should show different values for different user categories. In this example, the average value was used as the only verified data available.

VI SUMMARY

A. CONCLUSIONS

1. Although emphasis in the study was directed toward the impact of Hampshire College on the other four libraries, it is apparent that the current growth and mobility of the college population and the increased course exchange already have a pronounced effect on student movement and library use.

2. We predict that within the next ten years, it will be found more effective to have the libraries open to students and faculty from all five institutions. This belief is predicated on the assumption that resources and personnel would be better allocated among the five libraries as the result of such a step. The context for such a step is already coming into existence: standardization and automation in routine library processes; the mobility of students taking courses on campuses other than their home college; and the consequent and increasing difficulties of effective control.

3. In 1970-71 the number of interlibrary loan transactions of each college library will increase by approximately 8% due to the emergence of Hampshire College. By 1975, this will grow to a maximum of 33% increase for each college library. The latter figure is possibly too high for the real situation, because of the indeterminatedness of a number of variables.

4. The Hampshire student population will have a total book circulation in 1970-71 of between 7,500 and 20,500; in 1975-76 of between 45,000 and 123,000.

5. Using a number of assumptions discussed in Part V, G, it appears that, allowing open library access, Hampshire College may cause an increase in book circulation at the Amherst College Library of about 46 volumes per week by its second year of operation (1971-72)

B. RECOMMENDATIONS

1. The possibility of returning any library book to any of the five libraries should be explored.

2. For the first three years of Hampshire College (1970-73), Hampshire students should be permitted to use the other libraries on an open basis.

3. Studies should be undertaken immediately to explore the implications and effects of open use by all students of all libraries in the valley.

4. Studies should also begin immediately to develop compatible automated circulation systems in the five libraries and for a borrower's ID card which can be used in all of the libraries.

5. There is an immediate need for an in-depth survey of library collections in the valley: level of specialization, size of collection, amount of duplication, policy of current and future acquisitions. This must be supported by a realistic estimate of future faculty teaching and research interests at each institution.

6. We recommend that steps be taken immediately to develop an automated base for a union catalog of holdings.

7. We recommend that problem parameters be defined and data collected that will aid in developing a better understanding of library use in and among the colleges, as a base for broader planning and better decision-making.

8. We recommend that the systems model developed in Part V be refined and tested with computer simulation and random data input.

9. We recommend that a study be made of the feasibility of placing infrequently used books from each of the college libraries into a central storage area where they will have limited access but yet be readily retrievable if requested at any of the libraries.

APPENDICES

A. Hampshire College Projected Enrollment

B. Hampshire College Study Space Projection

C. Hampshire College Library Holdings Projections

D. Four College Course Registration (1962-Present)

E. Inter-library Loan Statistics

F. Miscellaneous Statistical Data Four Colleges

G. Exchange Students Terminology

APPENDIX A

Hampshire College Projected Enrollment

Estimates of Hampshire Students, Faculty, Library Seating, and Collection Growth, 1970-78, for use in predicting the impact of Hampshire College on the libraries of the other four area institutions.

These figures below are neither firm estimates nor firm projections of Hampshire's growth. They should be used only as one possible variation of a range of estimates of the growth of the college.

A. Estimates of student growth and degree of independent study, 1970-1978

	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Total Students	250	500	750	1000	1250	1500
Division 1	230	230	250	250	375	375
2A	---	230	230	250	375	375
2B	---	20	250	250	250	375
3	20	20	20	250	250	375
Faculty	20	30	45	65	80	94
Independent Study						
Division 1 (10%)	23	23	25	25	38	38
2A (30%)		69	69	83	113	113
2B (50%)			125	125	125	187
3 (100%)	20	20	20	250	250	375
Independent Study Readjusted						
Assume						
50% in (1)	12	12	13	13	19	19
basically (2A)		35	35	42	57	57
non-library(2B)			63	63	63	94
independent (3)	10	10	10	125	125	187
study.						

APPENDIX B

Hampshire College Study Space Projections

Estimates of Seating in Main Library and Related Spaces, 1970-1978

	Main Library		House Libraries	Total
	Book Section and AV Listening	Intran Center		
1970-71	269	15	---	284
1971-72	269	15	25	309
1972-73	317	15	25	357
1973-74	317	15	50	382
1974-75	317	15	100	432
1975-76	317	15	150	482
1976-77	317	15	150	482
1977-78	317	15	150	482

1. Estimates do not include faculty carrels.
2. Assumes that for first two years that SE section third floor, will be used for faculty offices.
3. Does not include bookstore or display gallery.

APPENDIX C

Hampshire College Library Holdings Projections

	Books and Microforms	Non-Book Materials
1970-71	30,000	1500
1971-72	42,000	2500
1972-73	53,000	3500
1973-74	64,000	4000
1974-75	74,000	5000
1975-76	83,000	6000
1976-77	91,000	7000
1977-78	98,000	8000

Building Capacity: 210,000 volumes, maximum
175,000 volumes, working collection

APPENDIX D
Undergraduate Four College Interchange
Course-Semester Registration

	1962-63		1963-64		1964-65		1965-66		1966-67		1967-68		1968-69*	
	From	to	From	to	From	to	From	to	From	to	From	to	From	to
Amherst	144	35	135	39	141	54	313	55	241	106	287	182	155	88
Mount Holyoke	48	17	117	20	119	25	124	51	115	38	96	51	52	60
Smith	39	138	37	125	34	124	121	227	165	215	190	247	103	152
U Mass	23	64	31	136	42	133	40	245	60	222	73	166	45	56

* Fall Semester Registration, omits movement of Amherst students to University of Massachusetts.

APPENDIX E
Interlibrary Loan Statistics,
1966-67

Loaned To	Borrowed From						
	Amherst	Forbes	HILC	Mount Holyoke	Smith	U Mass	Total (from local inst.)
Amherst	---	133	618 498	277 276	528 381	408	1964
Forbes	581	---	31	277	340	347	1576
HILC	---	---	---	---	---	---	----
Mount Holyoke	360 386	51	2371 890	---	293 258	214	3315
Smith	435 436	110 114	1315 1088	276 268	---	474	2615
U Mass	833	27	2727	457	654	---	4698

Note: Discrepancies in statistics due to variations in counting items.

APPENDIX F

Miscellaneous Statistical Data
Four College Libraries, 1966-67

	Amherst	Mount Holyoke	Smith	U Mass
Student Body	1,230	1,800	2,350	13,800
Open Stacks	yes	yes	yes	yes
Open Entry	no	no	no	no
Loan Period	2 wks.	3 wks.	2 wks.	2 wks.

	Amherst		Mount Holyoke		Smith		U Mass	
	No.	No. per Student	No.	No. per Student	No.	No. per Student	No.	No. per Student
volumes added	11,919	9.7	8,196	4.5	13,488	5.2	42,000	2.8
total holdings	405,000	330	303,500	170	510,700	217	428,000	31
total circulation*	100,000	82	77,300	43	130,200	55	406,100	30
general circulation	57,200	46	42,100	23	93,200	40	245,700	18

*Includes general, reserve, and carrel loans, but excludes interlibrary loans.

APPENDIX G

Exchange Student Terminology

X_i = number of undergraduates at school i registered to take one course for one semester at other schools. These students are also included in U_i. Note if a student is taking two courses, he is counted twice in X_i and once in U_i.

x_{ij} = represents an index number for actual library use for one person taking one course for one semester. Units are average number of uses/day/potential user. This represents empirical data obtained by studying library use habits of exchange students. It includes an adjustment to account for the student being on the host campus three times per week or in effect approximately 50% of the possible days. Note, because the exchange student is expected to be on the host campus 3 days per week, library use could be either averaged or considered as a maximum number for any day. The former approach was used in the example.

x''_{ij} = represents an index number that is a function of the actual course enrollment i.e., the number of students at school i enrolled in exchange courses at school j. This factor is comparable to the school distribution factor. It reflects the distribution of course enrollments used and therefore the expected distribution of library requirements.

AA000339

APPENDIX NO. 2
to
INTERIM REPORT
Project No. 7-1180
Grant No. OEG 1-7-071180-4351

RELATIONSHIP OF INFORMATION TRANSFER SYSTEMS AND EXPERIMENTATION TO THE DESIGN AND FUNCTION OF THE LIBRARY

Report of a Conference Held at
Hampshire College, Amherst, Mass.
January 25-26, 1968

Robert S. Taylor, Project Director
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April 1969

ED026548

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

PROJECT SUMMARY

The objective of this project is to provide an intellectual and empirical base for new departures in the relationship between the college library and its academic environment. Hampshire College, an experimenting institution, is the context. The library as an institution is in transition to new forms and new processes. The Seventies will be a critical period for this transition. This project is concerned with the isolation and analysis of five areas. 1. Cooperation among libraries and analysis of the impact of various levels of cooperation on the individual library. 2. Automation and processing of library materials and the effect on costs, staff, space, and function. 3. Relationship of book to non-book materials in the library, including interface problems, computer applications, library self-help, remote query and dial access, and the integration of varying media. 4. The effect of technological innovation on library design, organization, and function. 5. The library as a subject for experimental inquiry and as a focal point for institutional change. Within this context, the project will define critical areas of change, isolate problems amenable to analysis or experimentation, and develop fruitful models for evaluation of library systems.

TABLE OF CONTENTS

Report Summary

Background and Philosophy of Hampshire College . . . 1

I. Purpose and Background of Conference . . . 3

II. Participants . . . 10

III. Summary and Results of the Conference . . . 11

IV. Edited and Abbreviated Transcript of Conference Discussions . . . 16

REPORT SUMMARY

The objective of this Conference on the Relationship of Information Transfer Systems and Experimentation to the Design and Function of the Library, held at Hampshire College in January 1968, was to examine the relevance and mechanisms of the library to the college community. Three approaches were isolated. The first was basically a marriage of the conventional audio-visual service with the traditional library. The second saw the library as a switching center for receiving and transmitting messages. The third, less well-defined, saw the library as a process, rather than a physical place. The key concept is "commitment to experimentation." Experimental approaches must be developed both toward internal operations and external relationships. This requires a context within which education, teaching and learning are under critical examination.

In this context of rethinking the library, there were a number of critical points discussed which have relevance to the future design of libraries. Some of the major topics covered were: the necessity for perfection in maintenance, handling and control of media equipment; the possibility of integrated access to all media, at minimum through the catalog, at maximum physical integration; the necessity for unsophisticated equipment; the possible concentration by the Hampshire College Library in non-print media as its contribution to five-college cooperation; the necessary changes in faculty and institutional attitudes.

Background and Philosophy of Hampshire College

Hampshire College is a new, independent, experimenting liberal arts college which will open for students in 1970. It is intended specifically as a national pilot enterprise for innovations of quality in American higher education. Hampshire was brought into being through the iniative of faculty and administrative leaders of four institutions in the Connecticut Valley of Western Massachusetts: Amherst, Mount Holyoke, and Smith Colleges, and the University of Massachusetts. Hampshire is the result of planning begun in 1958, and its establishment was approved by the trustees and faculties of its four neighboring institutions. In 1965, the new college received a pledge of $6 million from Harold F. Johnson, an Amherst alumnus, and was incorporated under a charter granted by the Commonwealth of Massachusetts.

Franklin Patterson was appointed in April 1966 as the first President of Hampshire College. Dr. Patterson formerly was Lincoln Filene Professor of Citizenship and Public Affairs at Tufts University and was the staff director and a member of the Carnegie Commission on Educational Television.

The College now owns more than 500 acres of land in the towns of Amherst and Hadley, and is in the process of planning a campus and buildings. The architects, master planners, and architectural consultant are, respectively Hugh Stubbins and Associates; Sasaki, Dawson, DeMay Associates, Inc.; and Pietro Belluschi. Hampshire plans to have a student body of approximately 1500 by the middle of the 1970's and may expand in time to 3600 students.

The history and character of the early planning for Hampshire College are detailed in Working Paper Number One, The Making of a College, by Franklin Patterson and Charles R. Longsworth (Cambridge: The MIT Press, 1966). This volume which elaborates the intentions of Hampshire College, is not considered a static blueprint, but a thorough approximation of all aspects of the College's planning.

The Hampshire College program, as presently planned, introduces a number of departures from conventional academic procedures; among them a three-School academic structure instead of the more fragmented departmental arrangement, a flexible time schedule of three sequential Divisions in lieu of the usual four-year rule, and replacement of fixed graduation requirements based on prescribed course credits by a system of comprehensive examinations and independent research or creative projects. Time off campus will be encouraged for travel, work periods, independent research, and community service.

Hampshire College will undertake an innovative role in three broad inter-related realms of higher education. First, the College will seek, through continuing experimentation, consultation and review, to redesign liberal education so that

> . . . it better serves the growth in every human dimension--intellectual, emotional, intuitive, sensuous - of those who comprise its community, and thus offers a more substantial ground for continuing self-education and self-expression;
>
> . . . it may be a more effective intellectual and moral instrument of responsibility for the quality of life in America.

Second, Hampshire will seek new ways of securing the economic viability of the private liberal arts college in an era in which the demand for quality education is confronted with rapidly rising costs.

Third, Hampshire intends to spur the further development of inter-institutional cooperation in education in the Connecticut River Valley of Western Massachusetts, thereby serving the interest both of educational vitality and sound economy. Hampshire will thus aim to demonstrate nationally the advantages of a regional complex of closely cooperating public and private institutions.

The rationale for these fundamental aims and some of the current working guidelines for their development are set out in The Making of a College. Since publication of that volume, further planning has resulted in the design of research and development programs in major areas of academic and extra-curricular policy.

Hampshire College is explicitly designed to serve as a source of innovation and demonstration for American undergraduate education. The implications of this fact are threefold. First, while determined to avoid the kind of "laboratory school" role which so often compromises the institution's primary responsibility for its own students, Hampshire intends to develop and conduct its programs with a careful eye to their transferability: many of the lessons learned should be applicable to other settings. Second, the College will develop new techniques for self-evaluation, so that its experimenting character does not devolve into just one more narrow, rigid "experimental" orthodoxy. Third, through a continuing series of conferences, consultations, and publications, Hampshire will solicit other relevant experience and make widely known the results and review of its own efforst. The subtitle of The Making of a College - Working Paper Number One - implies a series of monographs dealing with different and successive aspects of the College's life as it unfolds.

I. PURPOSE AND BACKGROUND OF CONFERENCE

This small conference had several objectives. First, we wished to provide the Hampshire College architects, Hugh Stubbins and Associates, with more precise detail on the relationship of the Information Transfer Center (INTRAN) to the Library and on the physical requirements of those relationships. Second, we wished to explore and predict where possible the effect of new technology on the functions of libraries serving undergraduates. Third, and perhaps most important, we wanted to discuss ways the library, through the new technology, can move from being a static warehouse to a more dynamic institution, directly participating in the educational process.

The initial construction of an undergraduate library adequate to serve the needs of a high quality college of 1500 students, and the maintenance of the library's relevance in a rapidly changing world are problems of immense complexity and expense. The expense and the problems of planning and management are compounded by two phenomena of general significance to the future of libraries. The first is the possibility of significant technological progress in the storage, retrieval and display of recorded knowledge which may de-emphasize the total reliance on the book which characterizes today's libraries. Secondly, opportunities for cooperation among libraries are likely to become more attractive as technology facilitates interconnections of various kinds, as libraries' procedures become more standardized, and as increasingly easy access to information changes traditional storage and cataloging problems for the individual library.

Both of these problems are reflected in the present planning for the Hampshire College Library. To make the Library relevant to Hampshire's educational objectives, the Library must be prepared to adopt or to adapt newer technologies and media. The Library must likewise be receptive to applications of that technology to effect cooperation with other libraries. Such changes must be achieved within the context of a liberal arts college and within the limited resources of a privately financed institution such as Hampshire.

Within this context the Library at Hampshire College has several objectives:

. . . to provide a range of media in support of the book, integrating these different media where it seems feasible, economic, and educational valid.

. . . to establish an experimental approach to library processes, technology, and services within the Library itself.

. . . to experiment with and develop software and systems in support of education within the environment of a liberal arts college.

. . . to work actively toward the development of a cooperating network of libraries, first within the Amherst area and later encompassing a wider radius.

To accomplish these ends, the Library will either administer or share the management of several functions:

. . . the book library, including microforms.

. . . a book store

. . . an information transfer (INTRAN) Center, including an audio-visual center, studios and experimental laboratory.

. . . computing facilities for the campus.

The INTRAN Center is an essential element in Hampshire's search for economic and educationally relevant solutions to the problems of undergraduate education. We cannot today safely predict what the library will be in 1975 or 1980. We can prepare ourselves for change. These changes will not come as spectacular technological breakthroughs, Rather they will come as experience, opportunity and imagination allow us to experiment with and analyze the effects of devices and systems on the library and on its services to education. The INTRAN Center represents both the space and equipment necessary to adapt to change, as well as the opportunity to develop a posture of experimentation toward the library and related communication systems, and toward the learning process itself.

Within this context, the INTRAN Center has two overlapping functions: as a switching center and as an experimental laboratory.

As a switching center, it will serve as a sort of central nervous system linking the library, residence houses, audio visual center, and remote but relevant collections of data and computer programs. We expect the Center, for example, to play a major role in the development of automated systems for routine library operations. In operating such systems, we must relate the costs, including software development, to their relevance to and acceptance by users and to effective and useful communications within the growing library network, both locally and nationally.

We expect to be concerned with systems similar to language laboratories, but broadened to include other subjects as they appear feasible, in both audio and video formats. It will be necessary to take a hard look at dial access systems, both for instructional purposes and for querying the library remotely.

The impact on education of Electronic Video Recording (EVR), developed by CBS Laboratories, must be considered. EVR has the potential of providing inexpensive video recordings, playable on standard television sets. This development may well have a revolutionary effect on education and on libraries.

Hampshire intends to focus attention on the linguistics of both artificial and natural languages. The INTRAN Center therefore must be concerned with the role of the computer as a free-standing central processing unit within the college and as a device to be tapped remotely.

The Center will be the medium through which we will apply to the Library the findings of such studies as Project Intrex at Massachusetts Institute of Technology.

All of these are new systems or new approaches to the educational process, including the library. We must be sure that we are not merely attracted by gimmickry, but rather that these systems serve or have the potential to serve real purposes within the educational framework of an undergraduate college such as Hampshire. However, educational technology is developing so rapidly, and its potential is positive enough to demand that these systems be provided within a college environment and tested to see how effective they are. Within this context, then, the INTRAN Center will be a major component in Hampshire's desire to develop an effective meld of human and technical capabilities both for itself and as useful models to other colleges or groups of colleges.

The second function of the INTRAN Center, that of an experimental laboratory, extends and gives substance to the switching center notion. As an experimental laboratory, the Center will have several objectives.

The first derives from the recognition that present-day libraries are highly complex systems and are usually very frustrating to use. The INTRAN Center will therefore be concerned with adopting methods, developed elsewhere or developing its own methods, to assist the user in helping himself. Video, film, computer, and even manual display systems offer a tremendous array of possibilities hardly touched to help the library user.

A second objective of experimental interest is that of encouraging students (and faculty) to look upon the library as a laboratory rather than a warehouse. Attention would be focused on information retrieval and display and on human information-seeking strategies and behavior. Such experimentation would be accomplished through sponsored research projects, in which students, faculty members and librarians would be both experimenters as well as experimental subjects. Such an approach will help to break down the usual barriers which exist between the library and the community it serves.

The INTRAN Center will also provide facilities for the development of audio-visual instructional materials by faculty, and for creative efforts by students in the range of available media. It is anticipated that such efforts will eventually define a closer relationship between books and other media, and between the library and the community it serves.

The INTRAN Center represents an experimental and innovative approach foreign to most libraries. This approach, however, is basic to make the Library as conceived by Hampshire College something more than a static warehouse.

The following tentative outline of problems was sent to Conference participants before the meeting. The questions posed were seen as suggestive rather than prescriptive. They were stated only to provide a convenient summary of some of the problems we thought important at that time. Some questions were unanswerable, at least in the form in which they were stated. Our expectation was to provide a frame of reference within which we could function creatively.

A. INTER-MEDIA RELATIONSHIPS

1. Handling Problems

What special selection and cataloging problems exist with non-book media?

Do (or will) non-book media fit into the MARC system?

Can we physically integrate books and non-books in storage and still be practical?

Will physical integration really help "intellectual integration"?

What types of media can be stored "on line?" Is this possible in well-defined, high-use collections, e.g. reserves?

Should non-book materials circulate outside the library? On campus? Off campus?

Must AV materials be inspected after each use? How does this affect storage problems?

2. Accessibility

How do we search for materials in non-book form? for specific information?

What relationship does storage have to accessibility?

How can we protect the copyright of non-book materials?

Should we store a master tape and circulate only reproductions?

What role can the computer play in search and retrieval? What relationship can the computer have to dial-access systems?

3. Relationship of Print to Non-Print.

How can we best handle these various media so that they truly support educational objectives?

B. INTER-LIBRARY RELATIONSHIPS

1. Handling Problems

Should the valley have a union catalog for non-book materials?

How will inter-library loan policies affect such materials?

What is the role of duplication (and/or reproduction) in the inter-library loan process?

2. Accessibility

Should Hampshire College become the major center for these materials?

If so, what is the potential of "dial access" from off-campus?

What problems are raised by "dial access" systems from remote, i.e. off-campus stations?

What is the role of remote computer access, both for library materials and for programs or data available at other locations?

C. INTER-PERSONAL RELATIONSHIPS

What is the library's role - and the librarian's - in encouraging the acceptance and use of non-book materials? Does this role differ for students and faculty?

1. Faculty

Assuming their efficacy, how can the use of non-book media *and* their integration with print be encouraged? In class? As extensions of the formal teaching process?

How can faculty be made aware of new materials of potential use to them?

Are there ways faculty can maintain current awareness in *all* media?

2. Student

Will student acceptance of non-book media depend primarily on the faculty? Or will the students, within the context of the INTRAN Center, put pressure on the faculty for such use?

What physical arrangements are best to enhance student awareness of the continuum from print to sound to image?

3. Experimentation

How can experimentation with communication processes *and* with the variety of media be used to enhance the learning process?

Can experimentation in this field be viewed as another media? As a "meta media?"

D. INTER-DISCIPLINARY RELATIONSHIPS

What will be the relationship of the INTRAN Center to the School of Language? Language carrels? Computational Linguistics? Mathematics and logic?

To the School of Humanities and Arts? Film production? The study of iconographic and aural modes of cultural expression?

To the Natural Sciences? Computer programs and computer access?

To the Social Sciences? Data collections? Computer programs?

II PARTICPANTS

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III. SUMMARY AND RESULTS OF THE CONFERENCE

To use a phrase which occurred a number of times at this meeting, there was an "incredible richness of ideas" expressed in this Conference. Although our original intent was to seek answers to rather specific questions, it became apparent, however, as the Conference proceeded that the real direction of the discussions was to redefine the library. We felt these discussions were so fundamental, so stimulating, and so necessary that the Conference should explore and define its own problems. Such happenings are rare enough that one should not upset the delicate balance by insisting on a formal agenda.

It is possible that more questions were generated than answers. But sometimes questions, particularly at this stage of development, are more interesting and creative than answers. This does not mean that the original and quite specific questions were not discussed. It means rather that the answers came in bits and pieces, and in contexts frequently different than planned.

There were in general three levels or approaches one could take toward the redefinition of the Library. In the discussion, each one of these would reappear now and again in different guises, and with different sets of assumptions.

The first approach basically extends the conventional library to include types of media other than print, additional packages to be acquired, stored, organized, and disseminated. Within this context, the library remains basically a service institution, reacting rather than initiating. It is a marriage of the conventional audio-visual service with the traditional library.

The second approach extends the library physically by making it a switching center in which it both receives and transmits messages drawn from its store or from other organized collections. It is based not only on a variety of media, but on the capability to transmit those media. Such an institution utilizes dial access systems, facsimile transmission, remote access to time-sharing computers, and television and radio channels.

The third level is more difficult to define. It is both more subtle, because the defining words are imprecise, and more dependent on fundamental change in the environment surrounding the library. Rather than a place, it is a process. Under today's conditions, the library, within this context, rests on and utilizes the technology of the first two levels described above. However, the systems and devices are only tools by which the library becomes a creative, initiating, and dynamic partner in the educational process. It requires a fundamental change of attitude.

Given money and technical expertise, levels one and two are within the realm of possibility now. There is a rather important question as to whether this technology imposed on top of the conventional library (a) may topple an already unwieldy system, or (b) may just disappear, becoming merely another service, reacting to demand. The first may happen, but it will evolve rather than "topple," and one year the library profession will realize that the institutions it manages and operates are fundamentally different than those it thought it was operating. As. E. G. Mesthene has pointed out: "... it is notorious that adapting new means in order to better accomplish old ends very often results in the substitution of new ends for old ones." (Science, 161: 141, 12 July 1968). It also appears probable that the newer media and communications technology have some fundamental properties which, by their very proximity and use, engender and encourage basic change.

It is the third level to which the Hampshire Library aspires. It is important to understand that the Library does not act alone. It is part of a larger educational enterprise: Hampshire College. It is this enterprise, the College, which provides its raison d'etre and its context. It is in the relationships between the Library and its surround that will define the Hampshire Library.

From the discussions of the Conference, it became apparent that the key concept in this aspiration is "commitment to experimentation." The idea of experimentation is used rather loosely. It of course means first of all the controlled and measurable set of procedures which test an hypothesis concerning some observable phenomenon. The looser definition implies an attitude rather than a formalization. It seeks to take advantage of the environment surrounding the institution and, when feasible, to initiate change. Its success is not necessarily measured by the size of its laboratories, or by its sophisticated equipment, nor by the statistical deisgn of its experiments. Its success is rather a result of style and of a frame of reference, and it must be felt rather than measured. We hope to build both of these approaches into the Hampshire Library. However, formal experimentation with a social institution as complex as a library is costly and lengthy, and its results in an operating situation all too frequently are confirmed though fatuous reiterations of the obvious.

There are then two sets of problems with which libraries are faced: internal operations and external relationships. The first, and the one to which librarians have devoted most of their professional energies, is focussed on the operational requirements of a system. This basically confounds means with ends. One of the purposes of the Hampshire Library is to seek to redress this balance by concentrating on the library's relationships to its publics and its relevance to the educational process. This approach does not negate the

the problems of internal operations and systems. It does say that we must critically examine processes, techniques, and assumptions in an endeavor to determine which are trivial and can be discarded and which are necessary to accomplish our mission - creative participation in the learning process, served by economically justifiable operational routines.

The question of relationships requires a context within which the traditional processes of education, of teaching and learning, are under critical examination. Such a context exists at Hampshire College. It is worth noting, however, that the change implied for the library is so basic and so fundamental to the communications system which is a college, that its full implementation would require a revolution in education. Although this is happening, the process is slow and no one can predict the end result. It appears likely that education is in a process of transition. This may become a permanent state of affiars (to speak in contradictions). The major point is that the library - or some similar institution which includes its present functions - must become one of the initiators and evaluators of this process. Although never specifically stated in the discussions, it is apparent that the ultimate end of such rethinking is to change the library from being a physical place one can point to, to a process within which one lives and teaches and learns.

The following series of statements is intended to capture in abbreviated form some of the critical points discussed at the Conference. They are roughly organized from the specific to the general, from internal operations to external relations.

1. Maintenance, handling, and control of equipment for media operations is a formidable task and should not be underestimated. Unless it is done well, the introduction of non-book materials will encounter hostility and growing indifference. This is not dissimilar to the problems that libraries already face with print materials. The inability to match a growing book collection with the surge of demand has led in many cases to hostility and indifference. The best solution is simplicity, i.e. the careful selection of media, materials, and equipment, based on ease of operation and maintenance, and on standard devices without too much variation.

2. College libraries are usually designed with open stacks for browsing. A similar arrangement for non-print media is worth investigating. This could range from physical integration of all materials on the same shelf to separate types of storage within the same subject area to handle different forms (books, tapes, films, records, microforms) pertinent

to that subject. Such an arrangement would entail the scattering of listening and viewing devices throughout the storage areas.

3. In parallel with the development of proximate physical location of all media, it is necessary to develop an integrated catalog of all media. This poses some very real problems at this time, because the Hampshire Library will have a machine readable base for its book collection. The development of such a base for other media is nowhere near as advanced. This will require fairly extensive definition of catalog and classification data for non-print media, and formatting for compatibility.

4. With the growth of the paperback book and the explosion in duplicating, it is possible that the functions of the book library and the bookstore will merge and that the lending operation will shift to the more expensive non-print media. The legal disposition of copyright questions and duplication payments will play a major role in any such operation.

5. Whatever the level of media equipment and systems in the library, they should not be out of reach of the capabilities and interests of the people who will use them. The conferees felt that too sophisticated equipment tends to discourage basically unsophisticated users. Yet it is necessary to provide a level of equipment which stretches the interested user's capabilities.

6. Despite the usual attitude, there are many choices between the professionally produced film and nothing at all. Non-print media should be used in many forms or levels. We have not yet learned how to use these "lesser levels" effectively. We tend to be bewitched by perfection in non-print media, yet with print we easily range over the whole scale from mimeograph to letterpress.

7. Because of the proximity of four other institutions, each with an excellent library book collection, the Hampshire Library should concentrate on non-print media. This would be its major contribution to the five-college community.

8. If these objectives of the Library are to be fully achieved, then there are some necessary changes in faculty attitudes not only toward the Library, but toward the whole process of education and learning. Such changes are not necessarily based only on Library initiative, but the Library should be a part of that change. In fact, the extended and experimenting Library may become a focal point of that change. Some of the ideas discussed at the Conference are sketched briefly below as tentative models for change.

a. The instructor, like the Library, might look upon himself as a resource for the use of students, rather than a "fountain" which spouts expertise at specified hours of the day.

b. It should be respectable for a teacher to be also a learner, and conversely for a student to be a teacher.

c. The College might consist of two kinds of consultants, which may exist simultaneously in the same person: teaching or resource consultants and students or learning consultants.

d. A system of coupons might be given to each student, enabling him to utilize the teaching and resource consultants and systems on the campus for spcified lengths of time.

e. Such a coupon system might allow the college to truly evaluate itself within the context of student demand.

IV. ABBREVIATED TRANSCRIPT OF CONFERENCE DISCUSSIONS

The transcript of the discussions of the Conference have been abbreviated and edited in various ways by the Project director. The intent has been to eliminate the unintelligible, the incomplete, and the incoherent, and to retain the cogent insight and the well-turned phrase. This was a most stimulating and exciting conference, due principally to the fortuitous combination of participants and to a chairman who kept things well stirred. The Project Director hopes that, in making linear something that was multi-dimensional, the spirit of the dialogue has not been lost. However, responsibility for misquotations and misinterpretations must of course rest on his shoulders.

Two conference events are not included. The first was a multi-media presentation by Dean Giuliano, the Conference chairman, on "Knowledge Transfer in the Seventies." However, the discussion which followed this presentation probed a number of rather basic problems relevant to the theme of the Conference. Portions of that discussion appear about two-thirds of the way through the transcript and are noted. The second presentation on Electronic Video Recording by Tom Henry of CBS Laboratories is not included, because much of the presented material is now public knowledge.

Robert S. Taylor
Director of the Library
Hampshire College

PATTERSON. I'd like to welcome you on behalf of Hampshire College. We're grateful to you for your willingness to sit down with us and think about the planning and nature of Hampshire College's Library. This is a matter very important to us, as you can imagine.

It's almost a year ago now since we had our first general discussion in this room, leading to the first steps in the planning of the Hampshire College Library. We continue to see the library as central to this college. We see it, as Carl Overhage once suggested to me, as being symbolic of the whole process of education and of culture. We also see it as being a vehicle for part of the unique role of Hampshire College: to be continually experimenting in things educational, trying to push back the frontiers of teaching and learning wherever we have the wit, wisdom, and wealth to do. We are not very strong on any of those three "W's" but, to the degree we are, we will be trying to use experimentation to find in the Library, as in all other parts of the

College, ways in which undergraduate education may be more effective. This means that the subject matter of this conference is very, very important to us.

The kinds of questions that we raised a year ago, that we raised in our working papers, that will be raised in the discussion under the leadership of Dean Giuliano, are not to be taken as indications that we are "gee whiz" technologists, nor that we propose to jump off the diving board into a pool that may be empty, but that we intend to look as hard as we can at the kinds of new tools that may be available and may be useful in the dynamic educative function that the Hampshire College Library will have. In the process of doing this, I can't think of a group of this size that would have more strength than the one that is here today. I'm very grateful to Dean Giuliano for his willingness to lead this discussion, and to Robert Taylor for arranging it, and to you for taking part in it. Thank you.

TAYLOR: Thank you, Pat. I'll say a few words also in introduction. I think I'm egoist enough to think that the problems we are treating today and about which we at Hampshire are concerned are important in the design of future libraries, and also for their impact on undergraduate education. I should say that when I say "library" you may have to do some semantic shifting. I mean not only the traditional book library, but I also mean what we're calling the INTRAN Center (which I'm not sure is the right name but I don't know of any other one) which means a Computing Center, or access to computers, audio-visual systems, possibly dial-access systems, and the whole range of communication media. The Library also includes a book library, a bookstore, and a display gallery. This is what I call a library.

I think one of our problems at Hampshire is that the Library must be able to recognize what the problems are, and must be able to separate out those that are rhetorical, and getting down to those that are the water in the bottom of the pool, so that we truly approach them. This is certainly one of the concerns of this particular meeting.

There are constraints on this. First of all, there's always the economic constraint on what we can do in designing a library, and operating and planning for the operation of the Library. We must also make decisions now. We can't defer decisions as we go on. This is certainly part of the problem of architectural design. It has an influence, for example, as we begin to establish acquisition systems.

How do we initiate something now that we think we can live with five years from now. These are all relevant.

GIULIANO. Looking over the list of goals and talking to Bob last night, I might review some of these objectives. First of all, we'd like to give some help to the architects in laying out the extended library facilities. By extended, I mean, facilities which may go beyond rooms, systems which involve manipulation of space, people, media. Secondly there is a general goal. And I see that actually the second and third goals are very general: to explore and predict where possible the effects of the new technology on the functions of libraries serving undergraduates. And third, to discuss ways that the library through new technology can move toward being a dynamic institution, something that is an integral part of the educational process. I hope we can deal with these issues creatively. I think each of us here has a really relevant background and many things to contribute.

OVERHAGE. I might start this off by saying that Electronic Video Recording, for example, will be a tremendously important teaching aid. It will be interesting, and I'm talking about a field I don't know, in a history class to inject television text because so much of the real material of current history exists as a television record. And I think the way to get to the answer to this question is to find an imaginative teacher who would like to experiment with that sort of injection of new technology into the teaching process. And that's how you build up the answer. I don't think there's any other way.

TAYLOR. I think I would like to interject also or to make an addition to this - and an imaginative librarian.

GIULIANO. I guess I'm hearing this, too. I'm hearing a little bit of a dichotomy and I wonder of it's a necessary one. The way to innovate here, I heard Carl say and I agree, was to find an imaginative teacher in the classroom and that made Bob feel left out. Now, where is the librarian in this picture?

OVERHAGE. Indisputably an indispensable partner.

GIULIANO. But I think one of the questions we are exploring is, you know, how- Part of the problem is that if this teacher is imaginative, and starts out with knowledge of his field but not knowledge of the technology - how does Bob get into a dialogue with him, to help him do this?

TAYLOR. I'm asking a question, I think, something like this. I'm really attempting to make the Library far more than the warehouse it has been. How much do the building and the physical systems that are a part of this have to do with this process or does it depend upon the people we have, or is it a combination? I wish that this concern be not only compatible but in support, it must be in support of the pedagogical function of the College itself.

PATTERSON. The instrumentation of the library will have to be congruent with the character of the pedagogy we attempt. We do not intend to approach pedagogy at Hampshire as a laissez faire matter, as it is at most other colleges. We intend to make a difference in our selection of teachers for one thing and in their involvement in the reconstruction of curriculum in the process of working into Hampshire's operation. Second, I don't think Bob's question can be answered at all without saying that one of the functions of the faculty in Hampshire's instance, will have to be that it is not only a teaching faculty but a learning faculty in terms of its own skills and capabilities in teaching. It is going to need to study and be open to an examination of newer technologies and newer forms of pedagogy that are relevant to the kind of institution we want to have. In selecting people for our faculty, we are trying to see whether they are people who are capable of this kind of intellectual growth and this kind of development as teachers. The development of a faculty and the development of the Library have to go hand in hand.

GIULIANO. How much is geometric building, how much is technology, and how much is people? Is the Library a place? Or can we think of it as the information transfer institution, the transfer process that goes on within an institution? This means then that you do not want to call a space "the Library"; because that narrows your definition of what a library is.

PATTERSON. The Library simply as a discrete physical entity within the institution is not one of the views that we have held at any time in our planning. The Library means to me a network within the whole life of the institution. For example, in the design of our first house module, every single student's room will be connected to the Library by conduit. In effect, every student's room will be a seat in the Library at least from the standpoint of available conduit and cabling connection. The same is true of the academic building - our first academic building is designed to have a conduit from every room to the INTRAN Center in the Library. And it is also true of the Science Building. Incidentally our science consultants, most of who are from the Valley here have invented a most descriptive term for the kind of science facility we should have. They say, we need "a versatile barn," a building which has enormous capacity for variation and differentiation in terms of faculty needs and student needs.

OVERHAGE. I think, Vincent, you are actually asking at what time can we achieve the complete dispersal of the library. And my thought is that it is not probable by 1972.

GIULIANO. These remarks address themselves to your question, Bob. They have raised a number of other perhaps more fundamental questions and one of these is, what is the library, and how does it relate to the classroom? What is the classroom? Are these dispensable? If so, in what time span? And underlying all this there seems to be a question that comes up constantly - how do we achieve change.

WATKINS. A user, a student should have messages communicated to him through all of the five senses. This is not, at the present state of the art, possible. He is fairly limited at the present time to what he can actually get even if the conduits were now filled. He is fairly limited to the amount of information and the accuracy of the information that he can take. Now it would seem to me that the present question is this - how much is to be related to his room and how much is to be part of the INTRAN Center. This is a very hard question to answer. But I think it is the essential one, and it has to be responded to.

STEWART. I think if we would have the technology here and learning here, two different things. You can't say "Come to this school. We have technology available and we have learning available." What happens is almost pure chance, you know. On the other hand, you might say, "We are imposing technology. You've got to use this dial-access system and you've got to use a computer, and you've got to use these dormitory room learning carrels, etc." You are going to create problems with faculty here. Because they will not appreciate having this thing imposed on them. My experience leads me to predict that faculty will set about trying to prove to you that the technology won't work. Then there is a third combination here in which you impose learning. Learning has got to take place and I don't care how you get there, but learning has got to take place. Now we can say, "Here's the technology that you may use if it will help you achieve learning."

GIULIANO. How do we create an environment in which it is legitimate for teachers to learn, and for teachers to learn how to be more effective? This may mean how to create media or how to use media among many other things. And this is kind of a systemic question - how do we create the system, the environment for these people to come into?

SCHERTZ. I am willing to recognize the need to break the pattern of the library as a service organization; but it must meet the needs, the immediate needs and hopefully the future needs of a faculty or of an organization. It seems to me it has to provide these needs. I think there's no way for the library to impose itself on a faculty. In an acquisitions budget the most that one can do is first of all to meet the immediate needs and second to anticipate needs. It seems to me that if the library provides the accessibility to technology through the use of TV, or audio-visual equipment and material, then it has the ability to meet the future needs of whomever is on the faculty and it has gone as far as it can go. I don't see how it can predict what these needs are going to be and the most the library can do is to provide the space and the possibilities to meet these needs.

TAYLOR. One way a library can be more active in this, is by actually looking upon itself as something to be continually experimented with, not necessarily by librarians and faculty but by the students. I think the INTREX Project is an example where the graduate students who got involved in INTREX have become fascinated with some of the problems which they never thought of before: their own problems of information seeking, for example, within this process. Several years ago in offering an undergraduate class in the information sciences I tried an experiment with the students. I asked them to take any particular question that they really wanted to answer - any kind of question - and then to let me know, or write out if they could, the decision processes they went through, the people they talked to, the materials scanned, and the ways the question changed in this process. It was an illuminating process both for them and for me. For the first time, some of them saw this as a formal process, one that was not necessarily haphazard, but one that could be structured. I'd like to try the same thing at Hampshire. Another approach by which the library can be a more creative part of the institution is that a student in a course may say to himself, "Gee, that lecture, or the subject of that particular lecture, or that particular class was extremely interesting, but I don't feel the professor presented it quite the way it could be. It didn't come across to me as I look back at it." Now that student may want to go to the INTRAN Center and design that particular class again by trying it on audio or video himself and seeing what he can develop. This has tremendous potential for learning. I think that these are situations the Library can provide.

What I am looking for here is being able to provide the context both for faculty and for students in which they can do these sorts of things, and become aware of themselves as information seekers and knowledge seekers or learners or communicators.

GIULIANO. I here you saying we can create environments for the students whereby creativity or innovation is encouraged.

WATKINS. Could we form a postulate here at any rate saying that (1) the audio-visual center and the library should be identical - should be together really, and (2) cannot the librarian who in that case then becomes more than a librarian but also the custodian of all materials.....

TAYLOR. Custodian, I don't like that word.

WATKINS. How about curator? The curator has really a two-fold role. The first is, in addition to what faculty requirements are in a given course let's say, to look further than that and select what he thinks might be useful to that course. Then he makes that information available to the instructor involved by way of sampling, if you will, whatever is available at that time.

SCHERTZ. That's a passive role. That's a traditional library viewpoint in which the action is initiated by someone on the outside demanding something of the library, with the library responding by providing this particular item. I think Mr. Taylor is trying to reach a state where the library will be a dynamic and active participant in the learning situation and will not wait for the question, but rather meet the question head-on, before it even arises.

OVERHAGE. I think there was a very fascinating suggestion here a while ago that one might attempt to teach, let us say, physics by asking a student to prepare a lecture that might be an improvement on what had been previously presented - or a modification. Perhaps he would be asked in this lecture to give a demonstration experiment and one might imagine Robert Taylor stimulating a professor of physics into encouraging the student to make a videotape of such a lecture as an assignment or perhaps even an examination.

GIULIANO. Should the Library sponsor that?

OVERHAGE. The question is better - should the library stimulate this; and second, if this is done, then you clearly need facilities which are not comprised in the ordinary classroom. Those facilities are provided in the INTRAN Center.

MATZ. There may be something in that, however, that goes to the question you were talking about before, about the environment on a campus and the relationship of the library facilities to the teaching facilities. We talk about who are the learners and who are the teachers in the education process, the pedagogical process. I think teachers don't consider themselves learners. They may within their own specialty, but with regard to what they are doing in their own class, except at certain times, they consider themselves knowing what they are going to do. Now an environment might be somehow created in which it is understood that the Library, however it is defined, is a teaching tool for this teacher, an aggressive kind of thing, that had the responsibility to go out and seek a teacher. There would be those, of course, who would resent this. I was thinking, while Jim Watkins was talking about the function of the library, that I could not tell whether it was implicit in his notion that the library, when it acquires material, has the obligation to go to faculty members. There seems to be a notion of active and passive librarian. Perhaps the notion of the library, the librarian approaching faculty members and trying to engage them in the process of evaluating what they have. In that circumstance the teacher-learner might be a not improper model if it were seen as respectable to be a learner, as we hope it will be.

STEWART. You talk about the Library being part of a teacher, taking on some teaching functions and trying to get the teacher to be a learner. I wonder if you might, in order to try to pull these two together, if you could look at the totality as more of a resource. There are certain connotations with the word "teacher" that seem like the fountain. You know, it keeps giving out and that's about all. I think I would rather have this fountain under control where it is more or a resource. I wonder if you might not try to include teachers and to have them feel that they are part of the Library because all of us are resources. So the teacher looks on himself as a resource, at the library as a resource or anything else as a resource, for the use of the student.

OVERHAGE. We might list all the faculty as a roster of consultants. Not only would there be specialist consultants but also a group that functions essentially as tutors. Now the student upon arriving at the college is given a directory which contains the information about each of these consultants. He's also given a list of tests that previous sets of students have had to take at various stages of their careers as an indication of' what he has to prepare himself for. Finally he is given a book of coupons. Each coupon entitles him to ten minutes of the time of any consultant that he elects to go to. And then he can also use these coupons for a larger chunk of time in the library and its associated INTRAN. These are resources, if you will, at his disposal, and these coupons are his to distribute by whatever process he believes he can learn best and come closest to a successful accomplishment. This is being playful of course.

GIULIANO. But it is really being playful like this where we really hit creativity.

STEWART. If the institution is really for the learner, which we have been saying but which is not actually the case, then this idea would fit very well. The learner is achieving the goals of the institution but he may elect to do it completely independently. He may elect to do it using this or that resource person. In fact the tutor you mentioned might very well be a student who has already gone through and achieved and now is in a position to help other students who are coming through. This might be more challenging for them, say, to tutor kids and leave the faculty member more as a resource person.

OVERHAGE. Well, after all, a good many of the operations in the university already follow that pattern. The scheme of elective subjects is an expression of that kind. You can elect to take a subject from that faculty member who you think is the most effective and inspiring teacher. The way in which you can trade off library time against course time in many college and university situations is quite free and quite flexible. We are getting away from the idea of calling roll, or making people go to courses, if they think they can absorb more easily from books in the library, as some can. We don't insist that they really go to the lecture. To some extent these things are in operation.

GIULIANO. This is one way in which teachers would really get information about how well they are doing.

OVERHAGE. Well this is just a way of highlighting a problem that really hounds the administration of a university today.

GIULIANO. I think that, within limits, this makes sense. I come from a consulting business environment and what you are really suggesting is a consulting model. In the outside world the coupons would be money. Those people who are effective find their time in demand, and those who aren't have a way of knowing that they are not. They have a way of knowing that somehow things are just not connecting. I think that it is the absence of this kind of feedback in an effective way in the college that poses one of its basic problems, that of evaluation.

STEWART. Doesn't this bring up another thing? If the student has this book of coupons, he may initially start going to someone because he thinks everyone else is going to this person too, and he may find out that he is great, he is a tremendous person, but he is not helping the student to get where he wants to go. And the student only has so many coupons. Thus he is going to become rather efficient, which is one of the goals we might want to have in an institution. You want students to be able to make the appropriate decisions that will get them to where they want to go, most effectively and efficiently.

GIULIANO. There's another thing that comes into this coupon business. I don't know the extent to which this is true in a college but certainly it's true in the university. It seems that if you look at the progression of people nowadays it starts out where they pay because they are the customer and they pay tuition to a point where they are being paid. Graduate schools in many universities now have the objective of subsidizing all students with scholarships, tuition, and jobs. So we are getting away from the two-status system, where there is a customer who is a student, and the teacher who is the performer, to a situation where there is a gradual transition in which students get more and more compensation for what they are doing until they become faculty. Recognizing the gradual nature of this transition means, in part, recognizing that some of the teaching is going to be students teaching other students, it is desirable to use all our resources to help students teach other students. I made a mental note during the earlier talk, when you said that the teacher would go to the INTRAN Center and ask about material or the Center would go to the teacher. I think in some cases that teacher ought to be the student, in the sense that the student might get stuff from the extended library that no teacher has seen. It is the notion of students collaborating and taking initiative in developments in the library configuration that I find intriguing.

WATKINS. I am concerned about this dynamism that Bob was speaking about, because it is still the teacher coming to the Library and the Center, and it is still the student who comes. As I understood your remarks, it would be just the opposite. The Library-INTRAN Director would be going to them. I don't know who this person is going to be nor what kind of person he is going to be. He would have to be extremely versed in many things.

TAYLOR. Maybe I'm asking too much but I think this is what a good librarian should be. I would like to bring up an extension of some of the earlier discussions on experimentation in the library. I have a hope that we can develop a small core of students who work for the library, not necessarily in the dog work of sitting behind the circulation desk although there will undoubtedly be this, but rather using this small core of students to develop a sophisticated approach, within the students' terms, to this process of knowledge-seeking in an institutional framework, wherever or whatever it may be, a building or scattered resources. This arose a few minutes ago when someone mentioned the possibility of students setting up their own courses. I would hope that something might grow out of this and would be looked upon as a semi-formal way a student may become more aware of himself in the educational and learning process.

GIULIANO. I share your hope. The library is a communications resource and this functioning in the extended sense is a very important one. We've pretty much seemed to be in agreement that the instructional media center and the library ought to be the same. I sense that there is a lot of agreement on this topic. But what about the computer center and what about classrooms, which are after all communications vehicles. How do they tie in?

TAYLOR. We think the Computer Center should be part of the Library, whether it be remote access terminals or a free standing CPU. When we begin to get into non-print materials, such as magnetic tapes, audio tapes, video tapes, films, and slides, this becomes a little more difficult because part of our problem is that we don't know the extent to which this might be similar to traditional library operation. Do we collect these in the same way we collect books? Would we be talking about a collection of 100,000 audio tapes? I don't think we will, but maybe we are. Or films? For example, should we become a center in the Valley among the five colleges for this type of material?

STEWART. Is it not possible that, if you are really going to use a cooperative approach and if you can develop information transmission systems to a fairly sophisticated level, you should be extremely conscious of non-duplication. Who knows, it might be much more important for you to develop a small 25,000 volume library and take advantage of the others, but put in the 200,000 tapes or 200,000 visuals which the others don't have. Now if you set up something along the lines of 2500 megacycle television, it might not be too difficult to utilize transmission facilities in support of such a system.

JOHNSON. You are bringing up one of the problems that has worried the college libraries. We can just manage to take care of our own students and faculty physically. That is why we are glad there's going to be a library. With so much independent work at Hampshire College, they have got to be able to provide a great deal of that material at Hampshire because we all have problems.

GIULIANO. I wonder if these types of experimental functions are not some of the processes that might go on under the aegis of the INTRAN Center. I think the book part of librarianship is what you are saying - the book part needs a lot of R. and D. There is going to be a certain amount of research and development experimentation and innovation in librarianship going on in the INTRAN Center and in the Library. This campus is focusing on this. I really wonder whether you might not think in terms of having an undergraduate program in librarianship as part of the academic program.

TAYLOR. Actually there are some vague ideas about librarianship; more relevant is the program of the proposed School of Languages. We think of putting into this School mathematics, logic, linguistics, and computer sciences. One might better call it really the School of Communication in this sense. Certainly this has relevance to me as far as the Library is concerned, because I hope that some of the work of this particular School will be directed toward problems the Library is concerned with. This should not be the engineering or systems aspects, because I do not think we should get into these except as specific experiments within the INTRAN Center. Rather we should be concerned with the problems of utilization, display, and search for different types of physical things, as approaches to linguistic and symbolic statements as well. It is my hope that this School and the Library can work together in certain areas of applied linguistics.

SCHERTZ. I would like to raise a problem. You talk about experimentation. I think that one of the wastes now going on in the library world is that each institution here in the Valley for example is doing the same thing over and over again. And this is again away from the learning process - we are trying to meet the needs of the library's method of dealing with traditional problems of circulation, acquisitions, cataloguing, availability of information. Why must this be done on an individual basis?

GIULIANO. This is an area in which experimentation of a collaborative type has to take place. One of the problems here is that if you are trying to build something very very big, how can you get into it in a way that your failures are small? How do you fail small and safe, where you want to end up with something big? You really do have to take some chances along the line. How can you structure this?

TAYLOR. In part it is educated guesses. I am coming out of the next day and a half somewhat more educated in my guesses.

GIULIANO. There are three kinds of feasibilities involved in using technology for information transfer for education. First of all technical feasibility, that is can you do it at all? Then there is an economic feasibility, namely if you do it can you really afford it? Does it pay off? Then there is another feasibility that is even more profound. It is a sort of social system and human feasibility. That is to say it may be feasible technically, and economic, but getting people to work with and to accept it may be very very difficult. With educational systems for technology and with library systems, in many areas, we have broken through the technical feasibility level and through the economic feasibility level in the sense that we can afford to buy equipment that is more sophisticated than people can really use. So it seems to me a way of thinking about this is to say, given our people resources, how sophisticated are they? Then getting the equipment that they can really use at the time, and carry them through. Now what happens is that as they learn, they require more and more sophisticated equipment. We should not get more sophisticated equipment to start with than they can really use.

As people become more and more sophisticated in the use of this equipment, we bring in more, but always keeping ahead of them. To bring in a complete 16 millimeter studio without any faculty sophistication is foolish. Some organizations are out on that limb. In such cases, you have not got the input. You are not in process. You are not in dialogue with your faculty nor with your students. So the question is how do we escalate, how do we keep our human resources in touch with our technical resources.

I wonder if one of the problems here is institutional flexibility. One of the great advantages you may have, Bob, is institutional flexibility. A typical school system, for example, which deals with a school board finds itself in a rather rigid situation so in building a building they feel that this is the time to spend all their money on equipment, because this is the only crack they are going to have on equipment. So they go out and order everything in the catalogs. Then they have the problem of how to use it. Now if you can build an environment with your administration and Trustees where you can say to them that the College will very definitely have major investments, but it is necessary to discover a fruitful way into them, then you should not feel bound to spend the money now when you don't know how.

TAYLOR. This phrase - "discover a fruitful way into them" - is where an experimenting approach has importance in bringing the faculty, the student and the librarian into a discovery process. This is where the students will learn a great deal about the learning process. The faculty, we hope, will learn a great deal about both their teaching, as well as learning functions.

GIULIANO. One of the traps that we have been in is that we have tended to view media other than printed media as being either completely professional or non-existent. Now with printed media we have the scratch pad, ditto machines, the mimeograph machine, the xerox, the off-set press. The letter press is only a last resort. We can publish reports in mimeograph form. There are all kinds of levels of publication. The same thing should hold for images. We should not go on the assumption that there are no choices between the highly sophisticated movie and nothing. With images we should be able to have very crude mimeographed or dittoed versions via videotape. The movie is more sophisticated. Then the professional film is more sophisticated yet. And it's only when you want to publish a wide number of copies that you need to go to something like Electronic Video Recording.

OVERHAGE. Dr. Giuliano has asked me to say something about the status of microforms. I think a distinction must be made before I start, between the kind of thing we are attempting in the Intrex experiments to provide us a path toward the future and the much bleeker and more dismal picture of what really is available today and may be available in the near future. I feel very strongly that the use of microfilm in libraries has been held back by the absence of equipment that is truly useful in the library situation. Even the readers we have had, and have today, are of a kind that would repel anyone who wishes to use them for practical study. And the picture is worse when you start talking about printers for hard copy. The reader-printers available today give you a kind of copy that is physically unattractive.

Many of these things can be greatly improved. The reason why we have seen so little improvement up to now is that the industry that is involved has generally felt that there were markets far more lucrative than the library market for the exercise of the engineering skill that these developments require. I have the optimistic belief that this view will change, hopefully in the next few years, as a result of the injection of more substantial amounts of money into library operations. But I can't promise it. You'll have to wait and see if there is a real improvement. Certainly the situation as it exists today is pretty dismal.

GIULIANO. It seems to me that we are on the threshold of a change whereby the library will be viewed as a dynamic institution, as a major market, a place where things are happening. Part of the problem Carl has mentioned has been just this: there has been no research and development in librarianship. Compared to other areas this has been an area which has not had the benefit of engineers, or of scientists.

OVERHAGE. This is the same problem as a physicist or an engineer who demands from me an appraisal of the technical difficulty of producing really good microfilm reading and reproducing equipment. There's only one possible answer and that is that this is within reach of today's technology. It doesn't require fundamentally new invention. It requires a rather determined development effort. I believe, Bob, you estimated, that you expected to have the equivalent of about 50,000 volumes in some microform. I will assume for simplicity that it is microfiche. You will begin of course by having files of this microfiche material. Then you will be confronted with questions of how you provide actual reader service from these files. The simplest thing to imagine is that upon demand, you will take one of these microfiche out of its place in the file and give it to the person to use in the expectation that he will return it. The two hazards in that operation are first of all the ultimate integrity of the collection, and second the damage done to the microfiche when a careless person handles it.

What you may want to do at some later stage, when the use of microfiche becomes more general, is to make an on-demand duplicate. This is relatively easy and can be done in any service area. And then you either give away the duplicate or charge for it. Now what will the reader do at this point? He has a number of options, you see. He can use it right at the point of issue where you will surely have some kind of reader. This may not, however, be the most convenient thing for him because he may use it in conjunction with other materials. So I think in other places in the library you will provide desks with microfiche readers. You will provide readers in the house library, and some students who really take to this medium may have their own relatively inexpensive readers. Ultimately you will also have a machine somewhere in the library in which the user can insert microfiche and get xerox copies or similar copy if he prefers to have that kind of permanent material. Well now with those things in mind I want to raise a question - will you not want to have some microfilm service area, possibly adjacent to the bookstore, because in just the same way in which the use of books and the sale of duplicates and xerox copies are beginning to merge, here is a third thing that comes into that stream.

TAYLOR. There is that possibility. I can only say that by having a completely flexible building can we think of these things in, say 1975?

MCKEON. You haven't made any decision, Dr. Overhage, but when you spoke you suggested two alternatives of duplication: of the fiche itself and also full-scale print out. Have you made any decision between these two possibilities?

OVERHAGE. We are thinking of issuing a duplicate fiche to the reader. It then becomes his decision how he will use it. He may use it as fiche with optical readers and do nothing further or he may immediately convert to paper; or he may convert to paper only that part that really interests him.

MCKEON. And this would be simpler than printing it out in the first place?

OVERHAGE. Yes, I think so, and less expensive. The cost of making this microfiche duplicate is something of the order of 10¢. It may be a little more than that.

JOHNSON. Your collection then would be serviced because the student would never get the original. So he would not be able to go in and pick it out.

OVERHAGE. A little more fanciful. There are developments to do this automatically without the intervention of an operator But that's a little bit further away. I would visualize that we would start off by having an operator.

TAYLOR. A subject that keeps recurring is that of experimentation. I would like to pursue this a bit further. How do I begin to design meaningful experiments that can be performed and worked with starting in 1970, or before, which will tie the student and the faculty member into the library or information transfer process. That is to say they study themselves within the library and understand this process as part of the learning process.

OVERHAGE. The question is how do you launch intellectual enterprises? And I think the immediate answer will have to be that the most effective way of doing that is through faculty. Now you bring out the very troublesome question, one with a lot of emotional wallop, and that is what is the exact relationship between the people who will really be responsible for this Library-INTRAN complex and the faculty. This is something that is potentially difficult because the classical view of the library is a view that it is a service to the academic community. Therefore there will be some surprise on the part of the faculty if there is a display of initiative by the library into a domain that is traditionally the faculty's domain, namely the leading of students into intellectual adventures. Now I am not enough of a university person to suggest a possible solution to this but I think it is a problem that cannot and should not be minimized.

WATKINS. It is true, they are coming to you. But I just don't see myself how you can go effectively to each one of the students and each one of the faculty without rubbing hairs the wrong way.

GIULIANO. Could I take a different viewpoint? I think one of our problems here is that we have all been terribly polite and constructive and let me try introducing another controversy. Why do we have to buy into this view? Is this traditionally true in a university or the college?

WATKINS. This is not traditionally true of the college. Unfortunately there is so little independent and creative work asked of students.

GIULIANO. I'm with you on that point. The thing I am disagreeing with is this notion that it won't work. This notion being the idea of the INTRAN Center proselytizing and trying to stimulate work among the students. I really wonder whether we are carrying over the climate we know exists in most colleges today, the things we know are impossible in such a climate, and the years of accumulated frustrations we have built into us by not having anything done. A brand new organization should not have to have this cultural climate. We are projecting our experience which really may not be valid in this situation.

The real advantage you have here in a college as distinct from a university is not in the library, not in the availability of intellectual materials. The university has much more of anything you can name than you have here. The advantage is being able to have a small flexible, controllable, social environment where you can do things like this. You can innovate. You can discover things. Maybe a part of what we are hearing now is that we have to think of the library as part of the social system, in dynamic contact with the social environment.

WATKINS. I was looking at a person who was not only a librarian. He was also going to be a sociologist. He was going to be an audio-visual director. He was going to be an accomplished computer expert. He was going to be dean of the faculty. And finally he was going to be an accomplished diplomat.

TAYLOR. That's a librarian.

OVERHAGE. The administration might want to consider establishing this Library-INTRAN combination as an academic department, rather than as an administrative service.

TAYLOR. The important thing here is that I want professional librarians to work with and as faculty as much as possible, and with and as students. It is the need to get them out of the catalog department, for example, active with faculty either within this building we call the library, or outside in the laboratories and offices and dormitories.

WATKINS. With INTRAN, with Hampshire as a whole, what becomes so evident is the importance of selection of the people, whether they be in the Library or whether they be on the faculty, of a kind who will work toward a common goal.

GIULIANO. Aren't there two parts to this? One part is selecting people, another part is building an environment that keeps people open and that, as an environment or cultural property, keeps constant learning and experimentation. In the coming environment, education is going to be a continuing thing throughout life. The university or college is going to have to have a continuing education responsibility and it is not going to come in discreet lumps as it does now. It's going to come throughout life. When you look at the community institutions that are devoted to continuing education traditionally, it's the public library. So how do we reconcile these two?

OVERHAGE. You are saying this just at a time when the public libraries are retreating from that role and devoting themselves almost entirely to a certain segment of the public school population.

GIULIANO. What is the core profession and what does that consist of? I guess I come with a favorite answer which is that it is the one of communication or the transfer of knowledge. Everything else is incidental technology.

SCHERTZ. As the dean of a library school, have you seen, for example, students of your school who could fulfill even partially what is being discussed here, who have the expertise to function as a faculty member?

GIULIANO. That's a complicated question because library school students have tended to select themselves into this profession as a second-rate profession. They have tended to be to some extent people who are looking for safety and security and an absence of challenge. It is unfortunate but I think that is true. Now I have seen librarians, people practising as librarians who are among the most courageous people I have known.

SCHERTZ. Are there enough?

GIULIANO. No, not enough?

TAYLOR. If we establish the environment in which this is the acceptable thing to do, the persons we get should be able to grow into it, given certain conditions.

SCHERTZ. If you have an on-going situation, how much time can you allow a training situation to interfere with a working situation? Where does one begin and one end? Must you have a working situation to begin with and can you have the resources to allow you to have both a training situation and a working situation?

GIULIANO. I think your question is really a very good one. It makes it very difficult. I think fortunately in Bob Taylor's case, he's got three years.

SCHERTZ. But he's not involved in a working situation. He's involved in a model of a working situation. Until you are really involved in a working situation you cannot predict what the problems are going to be; then you can train on this basis.

GIULIANO. What you are really asking is can organizations change and can they be developed? My feeling is that you really do not know. All you can do is invest your competence to try and bring about change. We don't really know whether you can succeed or not.

WATKINS. The problem you mention for the librarians is just as eloquent a problem for the faculty, because they are going to have to be continually "in-training" themselves. Perhaps instead of calling us faculty or teachers and librarians and assistant librarians or whatever, we are all teaching consultants, and the only way we are grouped together would be with the students who are learning consultants if you will. I think that with the beginning size and with what the obvious impetus is at Hampshire, there is certainly an opportunity here. Now whether this will ever be realized is something that one can only hope for. But at least the opportunity is there, and it seems to me that the essence of the problem is in the selection of the people.

STEWART. One of the problems I have identified in working with faculty on the improvement of instruction is that when faculty are among themselves, departmentalized, they carry successful communication with one another using what I refer to as digital communication - verbal communication. And they are successful. But when they go into the classroom, in which there is a one way situation, at least until test time, they communicate to the learner in about the same way they talk to their colleagues, The learner, however, is not in the same position as the colleague. So you have introduced noise into the communication. They really should be starting to use what may be referred to as analogic type communication to help the learner understand what he is saying. Now by interspersing these people and by mixing them up and by calling them all teaching consultants or something like that, in conversation we will not be trapped, each one using only his own terminology. You will become better communicators by practicing. When you start working with students you may be more successful in teaching students just because you are in an atmosphere which forces you to do a better job of communicating. It does not allow you to become incestuous communicators, to the point where you communicate fine with your colleagues but you do not communicate to your students.

GIULIANO. Can a kind of collaboration be developed that allows specialization of unique features in unique places, and improves the overall effectiveness of the library? Are we bold enough to innovate with things like sharing staff and building on each others' resources? We have to learn how to innovate, not only in the technological dimension, but in terms of patterns of collaboration, in terms of relationships with administration, in relationships among centers, and relationships amont institutions. We have to learn to get along in ways that are very different than the ways we used to get along in. This is another area that the INTRAN Center really ought to be concerned with.

Multi-Media Presentation
"Knowledge Transfer in the Seventies"
Dr. Vincent Giuliano

GIULIANO. Much of our use of media has not really been successful because we've attempted to use the image media and the sound media as if they were printed words, for example, a movie or a videotape of someone lecturing. We haven't really made the kind of an attempt to be creative in using media within the context of education.

PATTERSON. There's a proposition in the psychology of perception which holds that perception is functionally selective. This means in effect that we perceive only what we are able to perceive, are prepared to perceive, and want to perceive. Our perceptions are conditioned by two major things: our psychodynamic needs, and our prior cultural experience. This proposition about the selectivity of perception is very relevant to the question of a library in a world that is in many ways exploding, and to the whole question of learning. While our prior cultural experience may not have included the world we were seeing in the presentation --- this booming, new, buzzing, loud, mixed-up world --- and therefore we are not able to perceive it except in terms of our older world, our students are not similarly handicapped. Our students - the present junior high school students who will be in college when our College starts - will have had complete immersion all of their lives in a world of television, a world of radio, a world of automobiles, a world of urbanism, all these things. Their perception will be functionally selective in terms conditioned by the kinds of events and multiplicities that the presentation showed. If this is true then, if these are the real people who are going to be perceiving things in institutions of education tomorrow, we need to take into account that this kind of conditioning is occurring. It seems to me it's a great challenge to a library that proposes to move with and into the 21st century to help education manage new media experiences in ways that are more than nihilistic or meaningless.

WATKINS. What seems extremely pertinent to everything you have been saying here is that throughout this there is a very real element of restlessness. It seems to me that rather than perceiving what we are often doing is simply receiving. We do not relate it and this is perhaps a cause of that restlessness. In the liberal arts tradition we have to find some way of relating it. I think that this is what our essential problem is.

GIULIANO. I so agree with you. The fact that these things fly in the face of our tradition. We struggle for a framework in which to bring them in. And then sometimes we find we just cannot get a big enough framework no matter how hard we try. One of the issues this raises is how much do we filter. There are so many messages and there is so much ambiguity that different people will get different things. At the other end if we structure things very concisely, it stifles learning and we have to decide how much filtering. And I think this is an important question for librarianship. How much filtering and how much structuring do we do in the information we present?

STEWART. I think you can structure confusion. I think it's one thing to set up a learning experience in which a student goes into the library and follows the pattern that many of us used to do years ago with the Easter bunny. We would get a message to go here and when you go here you get another message to go there. Finally you end up with a basket of eggs or jelly beans. There is a place for this kind of learning experience in a library in which you design learning experiences that help to utilize various sources to arrive at some goal. Then you can also design situations in which the student is met with a multitude of information that is available. Hopefully by then he has been taught selectivity, direction, and criteria, so that he now knows where to go and what to ignore. This is how I would look upon education, that is to enable the student to practice a certain amount of selectivity appropriate for his needs and his wants and desires. We must have some kind of structure even if the structure is only to structure confusion.

OVERHAGE. We want to give him the means of ordering it.

PATTERSON. It seems to me one of the things the liberal arts college does is to create in the best colleges a tremendous anxiety on the part of students that they are not covering enough; that is, that there's all that information and you ought to read every good novel that ever was written. Maybe the little lady with the Gideon Bible had a point. If you've read one great novel and really understand it and feel with it, it may be a great deal better than having read 500 pages a week for four years because it was expected of you.

GIULIANO. As educators or librarians we do create structures. That is our job. But they are very peculiar structures and sometimes they are structures that create vacuums within them in the interests of helping people learn. It seems to me the computer technology has gone the same way from a very rigid structure with batch processing where you had to be very right the first time you programmed the computer because you couldn't get another crack at it until next week in the old instance, to now when there's a great deal of interaction with the machine.

(End of Discussion of Multi-Media Presentation)

GIULIANO. We have to plan for the library of today. In order to arrive at where we want to go, however, we have to have a path of getting there from where we stand today. And so I'm more concerned about the fact that as the years go on, we develop real time auto tutorial facilities that will replace this. Can we move these walls? Can we move this function somewhere else? Can we change this building? Can we bring exhibits up here ? In other words, do we have a flexibility for evolving a physical structure into a configuration such as the kind we ultimately want.

MCKEON. There is something illusory about flexibility itself.

GIULIANO. The thing that really excites me about this is that in time as far as books are concerned I see the library gradually becoming a one way dissemination media. Xerox and similar duplicating service is the way it seems now but also paperbacks are one way. With the coming of microfiche and the ultra microfilm we are going to find it will pay us to give things out, perhaps for a fee, and not expect them back. The function of the bookstore and the function of the library historically are going to merge, so we will have two institutions running in parallel and what you are doing here at Hampshire is building them into an integral whole which may give you a chance to really experiment and innovate on this. That is very exciting. Not all, but most of your book material in fifteen years will be disseminable on a one way basis. And the place where you will use the traditional pattern of circulation and so forth is in your audio-visual materials, where the price and the value of this material is going to be great.

WATKINS. What we have been saying recently has underscored the necessity of some sort of physical flexibility for development and change.

GIULIANO. At this point, I think it might be appropriate to look at some of the questions that Bob is asking. For example, can we physically integrate books and non-books in storage and still be practical? Will physical integration really help intellectual integration?

TAYLOR. Should we, for example, in the music section mix a biography of Beethoven with scores, with LP records, tapes and perhaps even film and videotapes?

JOHNSON. You mean actually shelving them?

TAYLOR. Yes, should we have a record next to a book next to a videotape next to a film?

STEWART. I don't see why not. Particularly if you go into the cartridge format. You could have audio cartridges stored there very easily. Cartridge films when they are packed in a box look like a book.

JOHNSON. I think of the practical side; records being destroyed and so forth, and the problems of handling. I can see integration as far as the catalog. That you should have.

TAYLOR. The alternative is shelving by form; there are advantages on both sides. There are physical problems and they may be more important than the advantages of browsability.

JOHNSON. There is a kind of illusory feeling that open stacks are the solution. This approach says go to the stacks and find all the good material in a certain subject. So often it is the case that you only find the dregs there, because the good material is either out or on reserve book shelf, particularly if it is a well used library. Now aren't you basing this discussion, the advantage of this integration of many media, on the fact that everything will be on the shelves? If this is true then you have to go to the catalog to find the integration of the totality of non-book material. It seems to me that is much more useful, You will not be dependent then on the assumption that everything is integrated physically in the stacks.

GIULIANO. Could I argue the other side of that. A lot of access to materials is by a physical browsing mode. We do not see this so much in the library as in the paperback bookstores, where the book covers and the images are very important in helping people find what they want. The access is via this rich visual kind of demand. I am saying that we should try to have both. One type of intellectual organization is provided by a catalog. In addition it may really be desirable to have things next to each other even if it does take extra space, simply because the person who gets there is presented choices. To have this kind of special visual access may be of considerable value.

OVERHAGE. Don't you feel that the ideal way to provide that kind of flexibility and serve different categories of users equally well is the machine manipulated catalog, because then you can have any kind of organization that suits your purpose.

GIULIANO. I personally have mixed feelings. The answer is definitely "yes." We want to do everything we can with the machine manipulated catalog. This is very important because it's going to get us away from the rigidly structured catalog that traditionally can only be organized one way.

OVERHAGE. But you also want the physical tangible access wherever it can be provided.

GIULIANO. I am conscious of the fact, for example, that in my own bookshelves in my own personal collection, I use a variety of very odd visual cues to find things. You know, it's got a yellow spine, or I know that it's so big, or it's in that brown folder with the crumpled edge.

MCKEON. This is just the way our public describes the books they want.

SCHERTZ. I think there's a serious problem here with the economics of storage. This building is not overwhelming in total storage capacities. The more intermix you have, the more expensive the storage of any given item becomes. You can maximize the storage of small items by reducing the height of shelving and therefore use the same three-foot section and get two, three or four times the quantity you can get in a 12-inch height. It seems to me that, unless you have unlimited space, and you do not, you are going to have to take the other way out and try to maximize storage.

TAYLOR. This is something that I would definitely like to experiment with and see how it works, both from the standpoint of the user and from the standpoint of control and of shelving. There is no universal storage device. With these things you may have to get away from shelving even if you mix shelving with cabinets. Maybe with records or tapes we might have file cabinets right in the music section for example, or in the theatre or literature section. Players would be scattered throughout.

GIULIANO. In browsing the major issue is one of display as a means of access. Perhaps some innovation there, perhaps on the carousel trays you'd want to put something like a dust cover or something that really conveys a brief message.

TAYLOR. The carousel trays and video and audio tapes have not begun to touch what they have done with LP record jackets.

SCHERTZ. This raises a very interesting problem. There is of course the user's ability to define what he wants. Now you're talking about an outside service doing your cataloging which means your classification. This sounds awfully complicated trying to integrate various types of material into one classification system. This is the first question.

If you are using, for example, more than one outside agency for processing, you face the problem of having an integrated shelf list in each of these agencies because the thing to avoid of course is the duplication of class numbers.

TAYLOR. We do know something about this in that the duplication of class numbers appears to run about one in ten thousand. I am willing to put up with this kind of error.

GIULIANO. I think the point is that there are hairy problems connected with classification.

TAYLOR. This is the sort of thing that again we should experiment with. I'd like to know what the difficulties are in classification and in mixing and in the usefulness of various physical arrangements.

OVERHAGE. I wish to emphasize most strongly that checking and maintaining these non-book materials and their related equipment is a really formidable problem. Unless it is done well, the introduction of non-book materials will encounter hostility and growing indifference. Please do not underestimate the magnitude of that job. You have to have a full-time crew of really able technicians. If you can't see your way clear to provide this, there are a number of these non-book materials that I would advise you to stay away from. For example, cartridge projectors. I do not know of cartridge projectors at this time that are made well enough so as not to require constant attention if they are used by a large population of users. The video-tape equipment comes in this category with a vengeance. Most equipment must be considered within this group.

GIULIANO. Bob, I think this is a really important issue that we have gotten into. I think it could be enlarged even further, in that the space and the facilities needed for non-book materials for processing, for storage of equipment, for maintenance of that equipment, and for carrying on peripheral functions is astronomical in the places I have seen. There are all kinds of things you do not think of. For example, you need a slide duplicating facility, which requires a special machine and you have to have racks and work space, so there is a little room. Then you need to worry about the duplication of films, and that is a little room and a technician. There is editing and splicing and the room for dead equipment waiting for repair. At one large junior college I have seen, there is a space about half the size of this room here, just stacked with sick machines waiting to be made better.

MCKEON. Has someone been more quick-minded than I, and totted up the number of special purpose rooms that have been suggested. Really there is an amazing number of things and operations that appear to be required.

GIULIANO. It is pretty clear that choices in equipment, systems, and staff have to be made. The real question is how can these choices be made intelligently to meet the needs and economics of the College. I think this comes under the whole question of experimentation that is included within the INTRAN Center.

TAYLOR. I would like to ask one question here, certainly related to this. That is should we plan on having computer consoles, both in a specific area in the library and scattered throughout the building. These would be to provide access to common statistical and mathematical programs that are available at Dartmouth, or at MIT, or at the University of Massachusetts.

GIULIANO. I think the main distinction is over the use habits. For example the person who comes in and wants to write a complicated program to invert matrices is going to sit at that terminal for hours, two or three hours. He is going to hog it, whereas your reference user may just use it for a minute or five minutes.

TAYLOR. Of course we have the same problem with any particular device or object which may be in high use.

GIULIANO. It is as though somebody came in and made their main study use in the middle of the reference area. I think that is the proper analogy. You do not want people to be doing computing in the middle of the reference area, either.

TAYLOR. Yes, maybe we do, you know.

GIULIANO. Maybe you do and I can understand your approach, trying to stir up all sorts of activities. But I think it is like the problem of studying in the sense that you are going to get long usage. But you can regulate this as you go along. Could we go to some of the other issues here? Can you state for us what some of your main concerns are for the INTRAN Center?

TAYLOR. I must say that I am considerably more sanguine about the whole thing than I was yesterday.

OVERHAGE. I think that one remark that was made contains the really important clue here. That is that the materials now becoming available for consideration in INTRAN are coming on in such proliferation that willy-nilly you must be selective. One of your real problems is going to be to make wise choices. But I think it has to be recognized and stated in order to deal with it. You will not be able to embrace the entire spectrum, even on a sampling basis. Now we might have some discussion on that, but I am stating this in rather an extreme form. I was triggered by Mr. McKeon who said that we have not added up the number of things we have talked about here. Certainly, we haven't added up the dollars. This may in fact not be the time, and maybe Mr. Taylor does not want to at the moment. Now the job is to be selective.

MCKEON. Well this appears to be simply the projection of the older conventional library into the brave new world because when they dealt only with books, a small college had the same selective necessity.

TAYLOR. I would like to make some remarks in extension of what Mr. McKeon just said. I want to say quite firmly that it is my intent that we have a different kind of library, that we are not just extending or adding different kinds of packages to the collection. I think it is critically important, and this is a matter of posture more than anything else, that we are an experimenting library. I think this is critical. True, it is going to depend upon the people we have for this operarion. We also have to find a sort of cultural posture. This to me is our major difference from the conventional library. It is not that we will merely have additional media, but that we are open-ended and experimenting.

OVERHAGE. You assume that you have both faculty and students who accept this as a way of life. As is characteristic of such a situation, that service at all times will be somewhat fragmentary. It will not be the really polished service you might provide given all kinds of support.

TAYLOR. I think this is part of the Hampshire idea. What we have to transmit to the users of the Library is that the students, and faculty for that matter, are part of a pioneering venture, and must accept some of the problems that go along with being pioneers in an educational context.

GIULIANO. I wonder whether this might be an entrée to the discussion of interlibrary relationships, of whether the other libraries in the area can take advantage of the risks that will be going on here and be able to learn from the kind of thing that Bob will be doing here. In return for this Hampshire might be able to share some of the sturdy backbones that the other institutions have, for example, the solid basis of conventional library operations that the students here will be able to benefit from. Is there some real exchange possible on this basis?

MCKEON. I think we have talked in these terms all along. That is to say, viewing Hampshire's endeavors as trial balloons, as a guinea pig, and from their experience all of us learning something to our advantage. If you mean, to what extent may Hampshire College lean upon the other libraries in its planning, we certainly have no intention of doing anything other than to accept them into the on-going four-college cooperation. I have suggested to Bob that inasmuch as the Amherst Library will be the most convenient and most exposed, some thought might be given to putting a Hampshire Library staff member in the Amherst College Library. You see our problem is that there are far more students within easy reach than we can possibly accommodate. We have all had to erect bars of one sort or another in order to do our proper jobs, so that certainly I wouldn't want to envision taking on 1400 students that will be at Hampshire. With the messenger service, however, that now obtains, and which might be improved with greater volume, and without accepting the students as live bodies in the building I think we can do a good deal to assist. Our great fear is with the whole experimenting aspects of the curriculum and stress on independent study at Hampshire from the beginning, that dependence upon a neighboring library is going to be almost an unbearable load unless this is controlled somehow.

TAYLOR. This will be partly our responsibility in this question of selection for one thing. And it is also partly our responsibility to develop areas that the other colleges are not covering so that there will be some quid pro quo in the beginning.

OVERHAGE. As a matter of today's operation, I think that the five colleges could probably organize a more effective kind of service than each one can singly.

TAYLOR. For instance, if you add Hampshire Inter-Library Center as an additional library and Forbes Library in Northampton as an additional library, could we begin to look upon the seven libraries as one library?

SCHERTZ. I think there is a difference here. The University needs are in a way so separate from the undergraduate needs. While it is considerably

TABLE OF CONTENTS

Report Summary

I. Purpose of Conference 1

II. Participants 4

III. Summary and Results of Conference 5

IV. Edited and Abbreviated Transcript of Conference . . . 10

REPORT SUMMARY

The Conference on Planning for Automation in the College Library, held at Hampshire College in March 1968, was directed toward a discussion of the feasibility, economics, and planning necessary in automating a college library. The Conference resulted in a frame of reference within which decisions for automation should be made: (1) The Marc system is basic for compatibility, and only has meaning if it can be used to generate order and catalog information; (2) retrospective catalog data is of major importance to a new college library; (3) commercial processors are not yet ready to produce Marc data at a reasonable cost; (4) a machine-readable base is a minimum requirement for a new college library; (5) on-line systems are not yet practicable; (6) Hampshire's Library system should be developed in the context of the other four institutions.

Three approaches to automation were represented at the Conference. The first one was experimental and said that the Hampshire College Library should be experimental and innovative, and depend on the other four institutions for conventional services. The second, the systems approach, insisted that the sole purpose of automation was to provide data on the position and status of packages in the system. The third approach insisted that a new library for 1970 must still provide conventional services, but do so in as efficient a manner as possible, leaving time and energy for experimentation.

As a result of the Conference, the Hampshire Library developed a policy toward automation based on the third approach noted above, which is discussed in the body of the report.

I. PURPOSE OF THE CONFERENCE

A. The purpose of this Conference was to explore, in collaboration with knowledgable consultants, the problems related to the automation of a new college library, specifically the Hampshire College Library, and the degree to which such a library could and should automate at this time. We were particularly concerned with five areas.

. . . the level of current automation attempts as they applied to a college library.

. . . the economics of possible automation

. . . the economics of and degree of automation available from commercial processing services.

. . . the degree to which a new college library could truly innovate in the area of automation.

. . . the relationship of automation in the Hampshire College Library to the activities and functions of the other four academic libraries in the area.

As background and general agenda for the meeting, a statement was prepared and distributed to all participants. It is included in toto below.

B. Background Statement: Planning for Automated Systems in the College Library

Hampshire College is a new undergraduate college formed with the cooperative support of Amherst, Mount Holyoke, and Smith Colleges and the University of Massachusetts. Hampshire has two goals:

1. To experiment with innovative solutions to the problems of undergraduate education.
2. To demonstrate the educational and financial advantages of cooperative activity among four closely situated private colleges and a large public university.

In planning for a college whose first students will live much of their lives in the twenty-first century, Hampshire College proposes to develop a library which will, within economic constraints, take maximum advantage of technological innovation, both in the automation of its routine processes and through the use of new media in the information transfer process. Although there is a relationship between these two, we are concerned at this meeting principally with the automation of routine library processes. Such automation is of course not an end in itself. Its purpose is to provide the beginning elements so that users (faculty, students, librarians) will have easier and more complete access to knowledge and information in the library.

Two criteria are basic to decision in these matters, and both are of equal importance:

1. The systems should be economic. That is, they should not cost appreciably more than conventional systems. At the same time, they should provide desirable services and administrative data not available from conventional systems.

2. These systems should free the professional staff members from routines so that they can dedicate most of their time to students and faculty. We wish to have all librarians intimately associated with the teaching and learning processes, even to the point of offering courses, serving as tutors, and assisting in the design of materials for instructional support.

Several important facts should be kept in mind. The Hampshire College Library is starting off de novo. We are not afraid to experiment, if we are convinced that solutions will meet our two criteria. We will have students and faculty in 1970. Our systems must be operable at some level by that time. We are starting to build the collection now.

Within this context, the immediate question then becomes: What should we do now (a) to control our present acquisitions; and (b) to guarantee that we will have an economic and operable system in 1970? This requires that we design a system for 1970 and then work backwards to insure that we take appropriate steps now.

A general breakdown of areas of consideration follows:

1. How can the Hampshire College Library participate in the attainment of the objectives of Hampshire College?

2. What will a system look like in 1970?
   What will it do?

used on an undergraduate or popular level, it is not so in a research and graduate type of institution. It is very difficult to support the approach that simply because this material is not going to be used today, but may be used six months or two years from now, we will not store this for them, and they will have to go outside the institution for it.

OVERHAGE. As long as you can continue the present autonomous, comprehensive, and cumulative procedures, you will of course continue because the faculty will not allow you to stop. But the day will surely come and it is coming to Harvard, as it has come for MIT, where you cannot continue. Here you are in the unique position of creating the awareness at the start, you see, and not waiting until you are pushed into it but designing from the beginning for something that will ultimately be more stable and more satisfactory. You really have to create a climate for this kind of change and the institutions here have that opportunity now, particularly with the emergence of Hampshire.

GIULIANO. Well, there are several things that follow from what has been said. One thing is to train library people who are going to go into university settings in the problems of trying to communicate with faculty better, in trying to communicate what some of the real needs of the library and libraries are, and the problems that are created by policies that the faculty may adopt. That's one kind of issue. It was pointed out that in order to do what Bob wants to do he has to have the number of egregious facilities, to use Mr. McKeon's word. That raises the question as to whether Hampshire ought not to specialize or concentrate on some of these newer materials in the region, whether Hampshire might become the primary facility with the region for providing these materials and services.

STEWART. It may be that, if you share staff in their book library, as time goes on Amherst may be sharing some staffing in the media section at Hampshire.

MCKEON. This certainly appears to be the Presidents' offhand view of it. When it was pointed out to them that, in the present relationship of the four institutions there was always a *quid* for the *quo*, Hampshire would come into the picture with nothing to offer. And they said that all the audio-visual developments, computer use and so on would be taken over by Hampshire College in the interest of the area.

GIULIANO. I think that would be very sensible. That is certainly a better justification for doing the kinds of things you intend to do, than for just 1500 students.

WATKINS. That does bring up one question in regard to INTRAN. If Hampshire does become increasingly the repository of non-book media, there are the switching necessities. In other words, circulation is not really a problem. It is and it is not. It can or cannot be. So that this is going to mean some physical space requirements perhaps in the future and beyond that in the network of communication. Instead of moving the physical book you move the image or the sound electronically.

MCKEON And it might be added that we have had under discussion for some time the long range destiny of our cooperative library undertaking, the Hampshire Inter Library Center. There is the strong feeling on the part of some that, inasmuch as this is a commonly managed enterprise, it might very well be an element in what had been called the Valley Center and moved down to the Hampshire campus.

TAYLOR. We might attempt to develop a union catalog of non-book material because such material is relatively sparse and the catalog could be reasonably accomplished at this stage. If we start fairly soon, this could become in fact something immediately useful whereas the present book collections, with about 2,000,000 total, are almost too big. You see you would not just go to the libraries for this data but to all the centers on the various campuses that do have these kinds of media - the School of Education at University of Massachusetts, for example, or the Performing Arts Library at Smith. It would be an attempt to make a union catalog available of that sort of material.

WATKINS. Well this brings about, doesn't it, the necessity for some policy decision. Let's assume that Smith has a wonderful film library, let's assume further that Amherst one day would like to use one of these films. Let's assume thirdly that INTRAN is the switching mechanism to do this, to transmit it. I would assume that cooperation might even take the form of physically displacing the film library from Smith to INTRAN in that sense.

TAYLOR. With this of course you are getting into political problems, very thorny ones, of empires and autonomy.

GIULIANO. This is a question of how can you learn to move from a situation of strict nationalism to a common market kind of community. There are all the problems of autonomy and trust that you have to work out. It will take some time. I think all you really have to know is how do you get started in some minor way. It is close to the end of our time. I think we should spend just a minute saying something about this conference, and about conferences in general. All of us are going to be in one-day or two-day conferences like this in the future. If we can learn a little bit of something from this one, it might carry forward.

TAYLOR. I am much more sanguine now about the conference than I was during the first few hours. This is perhaps because I have begun to put a form or structure around the richness of information that has been coming to me. It is also possible that I was attempting to seek answers to questions that are basically unanswerable, or that only I could answer within a given context. My questions changed or developed during the conference. They became much more general with specific probes at various points. To me this has been an extremely stimulating fifteen hours. This has a relationship, a larger context here, for you realize that a conference such as we are having is an extraordinarily rich method of communication. So help me this is what I want to build into this Library in various ways. It's experimenting with the conference form, with communication, that will have relevance to Hampshire College and to the Library. On behalf of Hampshire College, I wish to thank all of you for your help.

AA000339

APPENDIX NO. 3
to
INTERIM REPORT
Project No. 7-1180
Grant No. OEG 1-7-071180-4351

PLANNING FOR AUTOMATED SYSTEMS IN THE COLLEGE LIBRARY

Report of a Conference Held at
Hampshire College, Amherst, Mass.
March 14-15, 1968

Robert S. Taylor, Project Director
Hampshire College

April 1969

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HEALTH, EDUCATION, AND WELFARE

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ED026548

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The research reported herein was performed pursuant to a grant with the Office of Education, U. S. Department of Health, Education and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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Bureau of Research

PROJECT SUMMARY

The objective of this project is to provide an intellectual and empirical base for new departures in the relationship between the college library and its academic environment. Hampshire College, an experimenting institution, is the context. The library as an institution is in transition to new forms and new processes. The Seventies will be a critical period for this transition. This project is concerned with the isolation and analysis of five areas. 1. Cooperation among libraries and analysis of the impact of various levels of cooperation on the individual library. 2. Automation and processing of library materials and the effect on costs, staff, space, and function. 3. Relationship of book to non-book materials in the library, including interface problems, computer applications, library self-help, remote query and dial access, and the integration of varying media. 4. The effect of technological innovation on library design, organization, and function. 5. The library as a subject for experimental inquiry and as a focal point for institutional change. Within this context, the project will define critical areas of change, isolate problems amenable to analysis or experimentation, and develop fruitful models for evaluation of library systems.

What kinds of inputs will it require?
What kinds of information will it produce?
What will it cost in operations? in staff? in equipment?

3. What will its relationship be to the other institutions in the Amherst area? To the New England Universities Library and Information Network (NELINET)? To the MARC System under development by the Library of Congress?

4. What steps can the Hampshire College Library take now? Can we design the card format and input so that we can start immediately to put the order process in machine readable form? the serials records? the catalog process? What are the costs?

   Can we anticipate remote scanning of the catalog? When? Does this require producing machine readable records now? If so, what format? Is it economic for a small college library to have an automated circulation system? Can a circulation system have any other than local usefulness?

5. What is the role and cost of commercial processing within an automated system? Can we economically move everything but book selection and user services out of the library?

6. How can non-book materials (audio tapes, video tapes, films, records, slides, etc.) be brought into an automated system?

7. Can the systems model we are designing be utilized by other new institutions? by established institutions? by groups of institutions?

II. PARTICIPANTS

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III. SUMMARY AND RESULTS OF CONFERENCE

The Conference participants brought up a number of positive statements which are worth reiterating and discussing. The "truths" represented by these statements have provided a framework within which the Hampshire Library is evolving its systems. The statements have also been a source of anxiety for they represent positions and financial commitments beyond the economic capabilities of a new private college, such as, the development of retrospective data in Marc format. These requirements almost say that a small college library cannot automate without exorbitant costs. This very fact, however, is a challenge to seek new library configurations both inside and outside the institution which will ease this financial commitment. There is, as the conferees repeatedly stressed, no alternative. The eight statements below represent a skeletal frame of reference within which systems design should take place, and their implications go far beyond the string of words making up the sentences.

1. The Marc system is basic for any national or regional capability.

2. The Marc system at this time only has meaning if it can be used to generate order information and catalog products.

3. The retrospective Marc data is of major importance to a new college library.

4. There is no "clean" system without a tremendous financial commitment by the library.

5. A new library must at minimum develop a machine-readable base for its holdings which is easily convertible to the Marc format.

6. Commercial processors are not yet ready to provide retrospective Marc data except at a very high cost.

7. Workable remote-access on-line systems are at least five years away, and any intent to plan on them for 1970 would be naive. However systems should be designed so as to be easily convertible to on-line operation when such systems become practicable.

8. Library automation at Hampshire College only has meaning

when seen in the context of the other four institutions. For economic and efficient reasons it is necessary, even required to think in terms of a cooperative system, either of the five institutions or of a larger complex such as the New England Library Information Network (NELINET) might become.

It became apparent in the course of the Conference that there were three positions relative to automation and experimentation in the Hampshire College Library. These positions were not necessarily opposed to each other, but they are sufficiently different in approach to indicate separate notice.

The first is what might be called the experimental and cooperative approach. Those who espoused this position basically said that the Hampshire Library should be as experimental and innovative as possible, and should depend on the other four institutional libraries for conventional services. Such an approach obviously requires commitments by the other institutions which they may not, at this time, be willing or able to undertake. However attractive the idea is to an experimenting institution such as Hampshire, it would require that the Library gamble with its basic responsibility - providing conventional service to its publics. This has, in at least one instance, been tried - with disastrous results.

The second position was basically a systems approach based on certain fundamental assumptions concerning the function and objectives of libraries. Those who held this position said that the primary function of a library system was to provide data for users on the position and status of packages called books, periodicals, etc. within the system. Adherents of such an approach insisted that it was necessary not to confuse the data in the book with the data about the book. It was the latter kind of data with which they were concerned. Products of such data, particularly when in machine-readable form, would be (a) catalog cards, book catalog, or on-line access to bibliographic file; (b) order data and status of orders; (c) circulation cards and systems; and (d) a serials control system. In the discussion, it became apparent that such a system depended on one of two things: either a huge retrospective bibliographic data base in the Marc II format, or the development by the Library of a machine-readable file in Marc II format of its acquisitions. The huge data base does not exist. The cost to the Hampshire College Library of keying the record of its own acquisitions for its own purposes only is too high a price to pay for an automated system.

The third position basically stated that the Hampshire Library must provide conventional services in 1970. It should at this time concentrate on building this core collection and on establishing highly efficient routines. At the same time it should have a parallel program which explores, defines, and designs new configurations of space, people, and systems, and isolates feasible areas for experimentation in automation and cooperation.

These three positions are not incompatible, given money, time and imagination. With the Hampshire bias toward extension, cooperation, and experimentation, the Library would like to break completely with the traditional warehouse image. Financial constraints are of course one major problem. However, perhaps more important are the factors of planning time, of the politics (in the non-pejorative sense) of cooperation, and, despite the many systems described in the literature, the paucity of hard data on costs and of explicit systems design. Another important constraint is the unreadiness of the library profession to make the necessary decisions on standardization and systems design. Such a state of affairs also effects the ability and willingness of commercial or governmental services to provide economic packages and systems for library automation. The library market for automation is still too unpredictable. It will come; but a library designed for operation in 1970 is caught in a betwixt-between land where landmarks are not yet plotted and compasses are erratic.

As a result of this Conference and of advice from other consultants, and a thorough analysis of the Hampshire College Library situation, the Library has developed the following framework for action and policies.

1. The Library will generally espouse the third approach described above, with as much of a commitment to experimentation and automation as is economic and practicable. This is not, as it might be assumed from superficial reading, a bland and fatuous statement. It is a positive statement designed to generate a long hard look at what libraries should and could do in an academic context.

2. The approach of the Hampshire Library toward automation is somewhat at variance with the second position described above - the systems approach. Although data processing is an extremely important first step in maintaining control of and in providing information about the status of packages in the system, it is only a first step. There are two further goals which must dictate the objectives of automation. The first is to provide access to the contents of the material in the system. That is to say the system must be able to respond positively to real questions in the real world. Second, library systems must work toward a re-packaging of the material provided its users, in whatever media, in whatever format. Automated library systems, particularly those which will manipulate linguistic, aural, and visual data, will have much to offer in this re-packaging process.

3. A core collection of books (25,000 to 35,000) for the Hampshire Library will be processed by a commercial processor. This is underway now (March 1969). The commercial processor will provide a machine-readable base for all monographs acquired. In spite of the strictures of the Conference participants, this record will not be in Marc II format. However, both processor and Library are concerned with the development of conversion programs.

4. As soon as feasible, the record of non-print items, of which the Hampshire Library intends to have a sizable collection, will be added to the system. We wish to have one catalog for all media, including computer programs, and for all operations (such as the bookstore inventory) included in the Hampshire Library. In the case of non-print media, we expect that the Library, together with the processor and outside consultants, will develop a machine-readable record based on the Marc format for this purpose.

5. Marc tapes for current English-language monographs are now (March 1969) being issued. These tapes will be acquired by the Library of the University of Massachusetts. From the machine record provided by the processor, the Hampshire Library will input data for its holdings for those items already on the tape. This will be the start of a union catalog and eventually a base for cataloging operations. The Hampshire Library will also analyze its machine record to see if retrospective items can be added to the current Marc tapes. In the meantime, we can only urge the Library of Congress to work on retrospective holdings in Marc format, particularly for college libraries.

6. It appears probable that the automation of Library routines will be most effective and economic when it can be accomplished within the context of cooperation. It is obvious that potential for such cooperation is high among the five institutions of the Connecticut Valley. It is equally obvious that such cooperation cannot be effected overnight. One of the objectives of Hampshire College is to be a catalyst for cooperation, and the Library is a major component of that process. Extensive discussions are now underway within the larger context of five-college cooperation. Agreements consequently are influenced by the needs and constraints of the library community, as well as by internal institutional relationships on each campus.

7. Like its parent institution, Hampshire College, the Library is committed to full and public analyses of its experiences and experiments in automation as well as in other relevant areas. This will be done

in the expectation that the controlled explorations of the Hampshire Library will be useful, perhaps even necessary in library planning in both new and established colleges.

IV. EDITED AND ABBREVIATED TRANSCRIPT OF CONFERENCE

The discussions reported below have been edited, reduced, and massaged in various ways by the Project Director. Complete and recorded transcripts of such discussions have a tendency to emphasize the weaknesses of each speaker - incomplete sentences, no pauses for punctuation, non sequiturs, and dozens of other "errors" which assume glaring resplendence when put down on paper, even though the words seem to communicate when spoken. In editing the transcript, the Project Director has tried to retain the level, content, and sometime humor of the discussions. He has tried not to violate the spirit and intent of each participant. However, blame for any misinterpretations and misquotations must inevitably rest on his shoulders.

Robert S. Taylor
Director of the Library
Hampshire College

TAYLOR. I wish to welcome all of you here today and to express my appreciation, as well as that of Hampshire College, for your participation in what is to be an important aspect of the College's operation. I would like first to give a little background on the way we view the Library within the College. One of the principal ideas back of the College is to use advances in information transfer technology to achieve effectiveness and economy. We expect the students to be able to teach themselves and to teach others. One must understand that this is a college, not a university library. This means that the bulk of our collection will be principally directed toward the student rather than toward faculty research. We anticipate eventually, with a student body of just under 1500, a collection of about 165,000 volumes, plus an as yet unknown amount of non-print material.

By the way, when I say Library, I mean the total complex we are planning: book library, bookstore, display gallery, computing center, and information transfer center. Another problem we must be concerned with is the relationship between the Hampshire Library and the other four institutional libraries in this area.

There are two specific criteria for the Library. First, we are concerned with the economics of operation and the effective use of staff. We would like to move everything out of the Library except the choice of input and services to the user, in order to free the professionals for maximum time with faculty and students.

Second, we are an experimenting Library. This is a conscious posture. How long we can maintain this posture is another question, of course. But we intend to try. I think the college library, particularly one starting off de novo, may have a much better opportunity than a large monolithic research library to experiment with the relationship between the library and the educative process. The Library becomes a living and operating laboratory - perhaps not, however, with all the experimental controls we may wish - in which student, teacher, and librarian can work together to improve the knowledge transfer process. I might mention a few of the areas we foresee as of possible concern: the relationship of print to sound and image and the reflection in the formal structure and operations of this institution; access to materials, both in the intellectual as well as in the physical sense; development of systems - displays and other approaches - to help the user help himself; the possible extent of student operation of the Library; possible library configurations among the five cooperating institutions. These are a few of the areas I can eventually see an interest in. The point is to keep the Library open-ended and adaptable to change. With these background remarks, I will turn the meeting over to your chairman.

KILGOUR. Have you any idea of the amount of dollars that are going to be available to in 1970 to operate this thing?

TAYLOR. No, not really. Hampshire College is, for the people who are here, an act of faith. We anticipate that money will be available in 1970 to operate the system at some satisfactory level.

KILGOUR. As you know traditionally, of the types of budgets in a college, the library's has been the smallest. Is this still going to be the case?

TAYLOR. Actually the Library budget will probably be higher than the traditional 5% or so, because we include so many other activities in the Library. I do not particularly wish to separate out the book library portion, and besides I anticipate a fair amount of staff overlap between the various parts of this combination. This I see as additional economics in the use of staff and in talent utilization.

SMITH. I would like to ask one question here. Have you predetermined that you will have books in your library? From the implications of what you have said, it may not be necessary, you know.

TAYLOR. Yes, we will have books. In fact, in the beginning we will appear like a conventional library, with a few trimmings. But I know what you mean and

I hope it will come up later in our discussion.

WOGRIN. When you talk about experimentation though, who is experimenting with what? Is it the faculty of the college which is experimenting with ways of teaching? Is it outside people to experiment with the faculty and the student body? Is it an experiment which allows the student body to experiment on how best to use the faculty?

KILGOUR. And the problem is with the undergraduates at Hampshire, as it was with a post doctorate student, not what you know but what you don't know.

WOGRIN. The point that I see here is that this attitude should permeate our university or college and the question really is - should the library cut itself off from that? can it in itself have something in its staff and in the specialities that its staff represent that will be relevant to the dialogue and to its role in education.

SMITH. We have been looking at the faculty-library relationship and saying that research is being done by the Library that the faculty ought to be involved in. It should not be just an internal library thing, but there should be a sense of involvement. Faculty ought to be directly participating.

KILGOUR. Your big question is really - what will the system look like in 1970? And I assume you are using the word "system" from the viewpoint of systems analysis, not from that of a circulation system or a public library system. A related question is - should you approach this as a problem in systems design or should you continue to apply procedures technique used in conventional libraries.

TAYLOR. I wish to use a systems approach; but this does not necessarily mean a completely automated system.

KILGOUR. Okay, fine. Now the question is what will it do? That is, what is the objective of the system?

TAYLOR. There are a variety of objectives.

WOGRIN. I don't think one can speak much about a system unless you can lay down some objectives, and work toward those objectives.

TAYLOR. Sure, I am speaking of general service to the user....

KILGOUR. Well now, I wonder if that is really an objective, because my feeling is that the college library service to users business is coming to an end. What you have got to do is to participate in the education and research activities of the institution, not just serve people who come in the side door or the front door or wherever it is that you have controls so that they can't get out with the stuff.

TAYLOR. Perhaps "service" is the wrong word, but let me use it for a moment. I see it as two things: first, the development of sophisticated self-help, so the user can help himself intelligently and with minimum frustration; and second, to extend the library outward so that it will be working with students and faculty outside the physical walls of the building.

KILGOUR. Good. I got the impression from what you said in your introduction that you really expect to have this thing participate and not be just a service institution in the conventional sense.

Now a system from my point of view is an on-going process to reach some objective that is information based. I better say what I understand by information-based. By information-based, I do not mean data, I do not mean knowledge. What I mean is information about the on-going process, about the system that is used. It's the data that's used to make the decisions as to what you do in the system. In other words, if we take a book in a technical processing system, the information that I'm talking about is not the data that's in the book, but the information about the position of the book in the system, and other characteristics that are related to it such as who ordered it, how fast he wants it, how much was paid for it, what time of year it is, how long it's been in the catalog department, and this sort of thing, which is something very different from procedure. And of course this is where the computer really comes in.

The computer can drive that information-based system, because it can make the decisions, or a great many of the decisions, as to what happens next. The technical processing system is an example of this kind of thing. So that when I am talking about this kind of system I am talking about a comprehensive system for your library. And once you get that designed, then you'll begin to get answers to your question. Now what kind of inputs will it require? If you have this kind of system, in which you have a huge central file where the basic unit is the bibliographic unit, through which, what is normally considered your four college library activities, are tied onto one basic unit, then you begin to get one answer pretty fast. In other words, you don't start cataloging tomorrow through a non-compatible system. You get that Marc II data by hook or by crook, and produce the catalog and everything else that is going to be tied right into that in this overall comprehensive system.

I think you've decided not to go it alone. I think it's imperative that, whatever processing you do, you should produce the Marc II format since you are starting at the beginning. So that you are built into a national system come what may. Has anybody got any objections to that? You've had some experience in this area, Dave. What do you think?

WEISBROD. Well, I don't have any objections. I just wish to express a clarification. At Yale we got into the business before the Library of Congress did in terms of computer processing of bibliographic data and we were unable to convince the Marc people that they ought to adopt our format. They are very close in many respects, but they are not identical. That means that we do not have compatibility in terms of the complete blind interchangeability of parts. We do have a capability of taking a Marc record and massaging it through a program that we call Marc Translated Edit or MATE for short, and coming out with a Yale record on the down-stream side. That allows us to bring Marc data into our system, so that we're not by any means isolated by stone walls, but we're not as completely compatible as we might be if we had decided to start our process in 1970.

EDMONDS. I would like to go back and ask you from the beginning what your definition of the total system is that Bob should be thinking of? Only for his own library or do you want to be thinking of the total system that we all, that is the five institutions, are supposed to be involved in?

KILGOUR. Okay, let's go back to model a national system, and within that, regional systems. I think that what you arrive at is a network. The nodes of the net will be regional systems, or at least groups of systems, and then within that node is going to be Hampshire College. Then if you design your comprehensive system so that it makes sense within the node, which in turn makes sense within the national system, I think you are in very good shape. Now, the node is certainly going to include the other four of you that are here. I might say that "region" is no longer a geographic phrase, any more than "space" is what it originally meant. It's for all kinds of stuff.

EDMONDS. Why couldn't Bob catalog his books tomorrow and still work this out at the same time?

KILGOUR. No, I think he's got to work this out. This is the first thing to do.

EDMONDS. In terms of practicality, he should just let his books sit?

KILGOUR. That's correct. The first thing to do is not to start cataloging but to just let them sit and get on with planning the systems design.

EDMONDS. He can borrow ours.

KILGOUR. Catalog?

EDMONDS. Books.

KILGOUR. Thanks - we're in business.

PETERS. I disagree with that.

KILGOUR. All right - now you tell us why.

PETERS. Because I don't believe it's possible to plan the system in detail that far in advance. If you wait for a complete plan of that, you will never get started on the other. I think you have to plan with an idea of what you are going toward, but at the same time you must go ahead with something practical today.

KILGOUR. I agree with that.

PETERS. You said "Plan the systems in detail!"

KILGOUR. I did say that, but I didn't say activate the system in detail. You're correct. You can't activate a comprehensive system all at once. The library is just too big to do this, even a brand new library. But you have to do it in a way in which the first part is the base from which you move, and, when you move, that the next part is going to fit.

JOHNSON. If you had only 170,000 volumes and if you have the ability to search bibliographically Marc or whatever, why wouldn't it be sensible economically, to have a card catalog? I can't quite see.

TAYLOR. You could have either or both a book catalog or a card catalog. I think this is a separate problem really.

KILGOUR. The advantage of a thing like a machine readable record is that you can get all kinds of products from the same record, without doing all the proof reading and all the other kinds of stuff. But the point is you are doing it from one record. The intriguing thing is, and we haven't really brought this up yet, is whether or not they can get along without a book form catalog and without a card catalog. If we were going to go into operation in, say 1974, it would be a different kettle of fish.

TAYLOR. At this time, I am assuming a card catalog.

KILGOUR. Maybe though, you want to assume a card catalog that you will jump to.

TAYLOR. Yes, that's possible.

NUGENT. I don't think anyone is going to burn their card catalog until they see these remote terminals work.

KILGOUR. Yes, but they ought to do it on the basis that this is what might happen, since they probably won't be working effectively before he has to make some decisions. I know darn well they won't.

WEISBROD. We were asking before what's the upper limit - how many people can join the system. I think there's also a lower limit. I think you also have to worry about what's the upper limit. If he wants to junk his card catalog and rely on terminal access, that means the file that he is going into from the terminal must be a file that contains localized information for his library. You suggested that in the New England system you may have specific holding information only for the six primary libraries, and let the secondary participating libraries interrogate the system only to find out what exists, but not in effect to interrogate their own catalogs, because their own catalogs are not reflected. Their holdings are not reflected in the New England listing. You've got to be participating in a system which is small enough that allows you to put your information in, which kind of bounds it from both sides. It's got to be big enough to be economic, but small enough so that you can afford to do the nuts and bolts bookkeeping for all of the individual institutional library members.

KILGOUR. It makes a lot of sense to design a college library not on the basis of how big it should be, but how small it should be.

WOGRIN. I think my approach might be different. I may come out with your design. I'm not sure, but I think I would have to start and say what Hampshire College is going to have is a collection of books. The object of having a collection of books is so that a collection of people, students, and faculty, could use the books; and then to ask what is required to do that. I'm sure I'm much simpler than you are because you have really been in these libraries and I haven't. When I speak, I don't understand all the assumptions that go with this. Am I wrong in saying that's the object of having a library?

KILGOUR. That's right. Well, these students and faculty, primarily the students have got to get at what is in this library and earlier I called it "data." I looked at it and it seems to me that perhaps we could still call it "data," and remember what Bob said. That the students in this institution are going to have access to this data in order to convert it into knowledge for themselves, on the basis that this is the way they're going to spend the rest of their lives. And this makes very good sense to me. The individual student will be working on some problem in connection with some artist or scholar or scientist, whether it be a historical problem or a creative problem or a criticism problem. He's going to get a lot of data and he's going to convert this into knowledge, which is meaningful and useful to him.

WOGRIN. Now, is that conversion process to be part of the system or does the system end before you get there?

KILGOUR. Now, this is part of the system as far as the College is concerned. This has got to be the objective - this kind of participation in the educational program, that is going to yield this kind of individual we are talking about. I think that in order to do that they are going to have to have a catalog. I am quite sure of that. Now, I was talking in terms of a card catalog; and the reason I did that was based on the assumption that he is not going to be in a position to have an on-line catalog in 1970. I'm not sure when he is, and that's why I said it was beyond the foreseeable future; but the foreseeable future is in relatively short years in this business.

WOGRIN. Well, first of all a catalog is a concept by which one can get at information about the contents of the library, whether it be a card catalog or a machine-readable catalog. In my approach, a system is first of all to try to get all the concepts designed, and then talk about the implementation and the techniques of implementation. It is only by having a block diagram, if you will, that I can see the various relationships. How will the catalog be implemented, the catalog being one of the products, as well as the circulation system? How will these things interact? I must know answers before I start talking about the specific implementation.

SMITH. Do we have the objectives sufficiently well articulated? I think part of the problem here is that the objectives can be pretty detailed, but that does not mean that you really implement it this way. You have to know where you are going. You have to have a sense of direction.

KILGOUR. Work has got to be done and there are two big holes here. One is the organization of huge files of bibliographic information, which has not yet been achieved efficiently, and the other one is that of remote consoles.

TAYLOR. I'd like to ask one question, particularly of Bill Nugent. Can you give me an estimate of what it would cost per title to get catalog information out of your system now? a year from now? two years from now?

KILGOUR. Can you define that a little bit differently? May I define it for you? What it would cost per title for them to give you a set of physical catalog cards and the equivalent Marc II record.

TAYLOR. Well, consider the Marc II unit as a separate unit.

KILGOUR. It can't be a separate unit.

TAYLOR. As a separate unit to us in our hands. I assume the existence of a large file which we can pull cataloging data from.

KILGOUR. No, I wouldn't do that.

NUGENT. We're not cataloging in order to create 3 x 5 cards. We are cataloging in order to make a machine readable record and if you want a 3 x 5 card, fine.

TAYLOR. O. K. I prefer to separate the two at the moment and consider them separately in cost. I'm assuming the existence of a large file which has machine readable record on it.

NUGENT. And many of the functions of the library can be done more efficiently if there is a machine file, and cataloging is one of those.

SMITH. It's easier to get those by-products.

KILGOUR. They're not by-products, they're all products. That's the difference between systems and procedures.

NUGENT. As to your cost question, we would have to do some projections there, too. We have a system running with one university library today and if you were to be Number Two then the cost would be rather high. Next week there may be two in the system. The week after that there may be three.

TAYLOR. What is the order of magnitude? I mean, can you give me any idea of the order of magnitude here?

KILGOUR. Are you asking for a dollars and cents estimate or are you asking whether he could give you an answer?

TAYLOR. I'm asking for a dollar and cents estimate.

NUGENT. We could give you a service instantaneously, but the dollar and cents estimate would be high.

TAYLOR. What am I talking about? a hundred dollars an item? fifty dollars an item?

KILGOUR. First of all, you've got to know how many he can get off a Marc tape, and how many he's got to do originally. So you've got to tell him something about the catalog.

TAYLOR. All right, let's say sixty-forty. Sixty percent in machine readable form, forty percent are not.

CURRAN. Not tomorrow, sixty percent.

KILGOUR. If it costs you no more to catalog for machine readable record, and then produce your catalog, than it does to produce your catalog cards in the old way, why do you object?

TAYLOR. I think it will cost more at this stage.

NUGENT. Yes, at this stage, I think it would cost you more.

KILGOUR. How would it cost him more?

NUGENT. Than to just send orders to the Library of Congress?

KILGOUR. Well, I know it would cost him less than if he did that. I know that if he did it by creating a machine-readable record and producing the catalog by this process it would cost a lot less.

JOHNSON. He hasn't got the staff to do it.

TAYLOR. What I'd like to be able to do, you see, is say that in two years or a year and a half from now - is to take advantage of the Universities of Massachusetts, Maine, New Hampshire, Vermont, Rhode Island, and

Connecticut and avoid input into your system.

NUGENT. That would be the objective.

WEISBROD. I suspect that what you have to do in order to take advantage in the future of this is nothing.

FURTH. Why could you not start doing this right now?

TAYLOR. People.

NUGENT. At some point though, you are going to have to decide that you will need a machine readable record of these retrospective items. So on this basis, I don't see any reason for preferring 1970 to begin keying efforts than 1968. You will have to do it sometime and some people will have to do if for you. But I think as far as the older materials go, there isn't going to be any great breakthrough between now and 1970.

SMITH. Will there be changes in the coding format?

KILGOUR. I don't think Marc III - It might be Marc IIA by 1972. There isn't going to be a Marc III for a long time.

SMITH. It is very difficult to get at the cost problem, in determining, for example, the stage at which one should automate a circulation system.

SCHERTZ. At a circulation of 400 a day, I wonder if you are not paying far too much to automate a circulation system.

PETERS. The best thing, or one of the best features, that Lehigh got out of out of its automation in circulation was the automatic sending out of overdue notices. They went out each day automatically.

SCHERTZ. At a cost of how much?

WOGRIN. You have to be careful when you do an analysis of that type - that you can indeed ask all the questions.

KILGOUR. You are just asking the library question. Now I once put in a highly automated circulation system with edge-notched cards. I ran down my own costs and built up the user's costs. Getting into the library systems planning and research problems, what did the conference at Yale last Fall suggest?

WEISBROD. They felt that any forward-looking organization, non-profit or otherwise, ought to be devoting 10% of its operating budget to self-analysis, review, development, keeping abreast. This is not research and development: just making sure you are doing what you are doing in the best way possible. Don't do a small piece of research; instead bite off a big piece and do it well. To do something really significant in the library area will require about ten million dollars. Individual faculty members could do a small piece of research, but it would not result in anything that would turn the field inside out. Along with this, it may not really be the amount of money you spend in one year or in ten years; but rather a reasonable goal should be established. For example, we might have a well-defined, but sticky problem we want to solve. Give ourselves five years to solve it.

BUCKLAND. In these large projects, the first steps they take, you know, are pretty primitive, and not much different from what you could do with a small amount of money.

KILGOUR. Hampshire begins with a clean slate. It is really depressing the number of nineteenth century library techniques that have gotten themselves computerized.

NUGENT. You're going beyond books - you are saying that the library is an educational resources center.

SMITH. Why don't you put faculty interests and skills in the library catalog and allow students to browse through the faculty?

DUNNINGTON. You know which faculty are taking out which books. I think there is an important thing here. Many faculty pick up side interests, which are not represented by the fact that he is in the physics department or something else, but he definitely becomes a scholar in this area. And only you, the library, and he may know that. And if this could be communicated to the students or at least talked about, it would be useful.

BUCKLAND. There are two different kinds of dialogues we are talking about in respect to holding the interest of the student. One is personal, which is always inviting. That is, there is an immediate response and a meaningful response. And any dialogue that anybody has now with a piece of text is terrible by comparison. So this is the place that we want to work. You want to get some schemes of having dialogue with text files that are as alive as talking with a person. The dialogue is important. You ask questions in a vacuum and you get very little response as to what to do next. Look at this blasted catalog card. It doesn't have anything on it. You see the title. There should be more - various levels or surrogates of these documents - so you could see what's there. Talk about an experiment, I don't mean to replace the reference librarian, but I think lots of things that they do in a library could be replaced by a question and answer type dialogue with some sort of immediate response. None of this business of walking two floors back. You must do it so that it is like talking with a person.

NUGENT. A library experiment, that might be good especially from the point of view of the librarian as the instructor, would possibly be a course in information gathering.

EDMONDS. Why bother with the library? Are we creating a very elaborate structure that is really unnecessary?

TAYLOR. We may have. This is a good question. Students may be getting their information and knowledge from other sources really. I think the same question may be asked of the conventional classroom.

KILGOUR. Is it proper for the Hampshire College Library to be involved in this kind of stuff?

BUCKLAND. To me a fundamental problem in this whole thing is that the business of physically transporting books is a pain in the neck. Nobody wants to do it. They like to let you have the image but they do not want you to have the ink that's on the page. I mean, they don't want to let you have the physical thing. In spite of what everybody says I think they really don't want to do this. And all these experiments that have been done on facsimile transmission and so on are quite discouraging. I just wonder if there's not some other really basic approach to get these images around, without having to physically transport this paper. I don't see why, you know, a journal can't drop an aperture card in the issue of the journal at the time it's published.

TAYLOR. Copyright problems would be liable to come up, I'm sure, and perhaps become more severe. The cost of copying has got to drop obviously from the normal 10¢ a copy down to the two cents a copy, or even one cent. And you have to be able to walk off with a good quality black and white image.

BUCKLAND. This copyright business. I think it really stifles any kind of long range engineering approach. I hate to see the thing go right down the road of traditional library with maybe a few computer routines.

WOGRIN. What you are referring to, as a matter of fact, is that, if you have a new library or a new college coming into being, then one ought to take advantage of this to set up a development project in which the economic part is not going to be the objective. It can't be a cheap development. The object is to do a development which is funded as a development whose objective is to find out how economic these things can be.

KILGOUR. Yes, and here you have an opportunity particularly with a new library, in which the total library as it goes into the future can be in machine-readable form, and can be manipulated in this way. The other four colleges take advantage of it, because most certainly you are going to be duplicating to a considerable extent and you can cut down on the duplicative activities. There are real possibilities here. If he computerizes the classical library system, he's going to come a cropper. The only alternative is to do a systems design - an innovative systems design.

BUCKLAND. To me the approach is to try it, even under adverse economic conditions. Then at least you've got something that's running and that somebody can look at.

SMITH . Now what we have really talked about here is that Hampshire College is going to end up with a Library, 60% of which is traditional and 40% in which they can innovate slightly. If we look at all the libraries in the area here, we would say that one extreme solution is that the whole traditional approach should be handled by the existing libraries. Hampshire's sole objective would be to send its students to, or to get images from these libraries for traditional purposes. Then Hampshire College could innovate completely and be dependent on the other libraries for traditional services. It would also innovate to the degree and in a fashion so that it could give something to the other libraries that they do not now have. In other words don't look at each library independently, but look at all of them as a single system. And say now what Hampshire Library's role could be in this system. What could it innovate that would help the other libraries? How could they trade? In other words, put 100% of your money in innovation at Hampshire College. Otherwise you will have a very small area of innovation. And the only way you can avoid it is by cooperation with these four other libraries. You are going to have to give them in return some leverage on their problems. You are going to have to do some experimentation that will have a positive effect on their performance.

TRUESWELL. What can the four colleges do for Hampshire. I think, although we have talked a lot about innovation here, there is one group of people you are overlooking - the faculty and the students. They are hard to change.

You do not change their behavioral patterns easily, and they want to use books. They don't want to sit at a console and have some choir book come back or only one or two pages. I think you really have a two-fold problem here. You have the immediate problem of setting up an operating library here for Hampshire College. This is going to have to take into account the core collection, namely a number of volumes that will satisfy most of the requirements. This has been kicked around quite a bit, so that you minimize the drain on the other libraries. I think this one operating problem that is certainly feasible. It's a question of how you determine the core collection. This is an operating problem that is going to take all of the lead time that you already have. Then you have these experimental and R and D problems that you're talking about. These are longer term problems, because part of the technology is available, but the technology is changing so rapidly that, if you jump into one area, you may find yourself left behind entirely or completely outdated within a few years.

In this way you can gradually educate your users into using innovation. I think if you don't get into this on a gradual basis, you will be jumping in too quickly. There are then two problems. One is the immediate operating problem of getting a library open - a conventional, ordinary, as modern-as-it-can-be library. And then some analysis of doing something you really want to do. I think that is a study that will take time, with large funding.

SMITH. I do not think the conventional consideration ought to constrain the Hampshire Library. It ought to be an area consideration, to maximize Hampshire's role. For example, Hampshire has the opportunity to emphasize and specialize in the non-book areas. You may have different kinds of cataloging problems as you specialize in these areas. I would like to see one approach tried for everything, whether the user is coming in to buy a book or to listen to a stereo tape. They walk in the same door and start branching to different areas. In other words, your horizon of browsing is much greater. If you could offer this to students of the other colleges, you would be offering them something immediately, that those other institutions did not have to offer. At the same time you may have to lean on them for more or less standard collections and services, while you are filling up to whatever degree you feel is necessary.

DUNNINGTON. In this way Hampshire would really contribute something to the other four institutions by picking this up, if they do in fact realize this. Not that they are trying to push the other colleges, but they are in fact trying to help the five-college group.

FURTH. And by doing that they are also defining their own role.

SMITH. This, in effect, is the first experiment, because you are proposing something, and people are looking and reacting and measuring the reactions. You are talking about the level of innovation. You are measuring the reaction to your ideas.

KILGOUR. There should be some kind of group set up to specifically delineate the objectives of a library system that involves these five institutions. Set the priorities, and then move in that direction. But I think the librarians are going to have to set the objectives of the five colleges in this area, even more precisely than your administrations can, in the sense that the librarians are going to have to hit something in a practical way.

FURTH. You have to be careful. A system cannot be designed by a committee. What a committee should do is define objectives, and then submit a proposal to get someone on board to worry about implementation.

TAYLOR. We are reaching the end of our time. I would like to be able to say we are starting the whole thing tomorrow - all the things we have talked about. But I am enough of a realist to know this is neither possible nor advantageous. However, I think I know the alternatives better than I did two days ago. There are some things that can obviously be done now. There are others that will have to wait until the day after tomorrow. What has been most helpful is the airing of possible approaches and particularly those related to five-college cooperation. I thank you all very much for coming.